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Revision of afrotropical *Anthomyia* Meigen, 1803 (Diptera: Anthomyiidae), with descriptions of ten new species

by

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ABSTRACT

The afrotropical *Anthomyia* species are revised to include 19 species. Ten new species are described: *acutula*, *concava*, *latilamina*, *malagasica*, *parapluvialis*, *stuckenbergi*, *subabyssinica*, *subornata*, *verecunda*, and *whitei*. Four new synonymies are established: *Anthomyia griseobasis* Malloch, 1924 = *Anthomyia maculigena* Stein, 1913; *Anthomyia inda* Ackland & Pont, 1977 (new name for *indica* Malloch, 1924, preocc.) = *Anthomyia benguellae* Malloch, 1924; *Anthomyia spinigera* Malloch, 1924 = *Anthomyia abyssinica* Jaennicke, 1867; *Hylemyia fasciata* Walker, 1858 = *Anthomyia amoena* (Macquart, 1851). The majority of the afrotropical species (16 including those described in this paper) belong to the recently proposed *Anthomyia pluvialis* section (Griffiths 2001), which corresponds to *Anthomyia* in the previously restricted sense. The remaining three species belong to Griffiths' *A. liturata* subsection. In addition to the *A. pluvialis* superspecies (already characterised by Griffiths), three new superspecies groups are proposed for the afrotropical species in the *A. pluvialis* section: the *A. ornata* superspecies, the *A. amoena* superspecies, and the *A. abyssinica* superspecies; one species (*concava*) is treated as a species *sola*.

INTRODUCTION

Anthomyia (as currently enlarged to include *Craspedochoeta*) contains approximately 84 species worldwide. This number includes a large number of recently described nearctic species, mainly belonging to the *A. liturata* subsection of the *punctipennis* section (Griffiths 2001). Griffiths recognised, in total, six sections of *Anthomyia*. The approximate number of *Anthomyia* species described from each region is as follows (total number of species recorded in each region in brackets): 21 (26) species in the Palaearctic Region; 17 (23) species in the Nearctic Region; 18 (19) species in the Afrotropical Region; nine species in the Oriental Region; and three (4) species in the Australian Region. The number of neotropical species is unclear. At present there are about 16 described species, which mostly seem to belong to the *A. punctipennis* section, and none to the *A. pluvialis* section.

The earliest description of an African species of *Anthomyia* was *tempestatum* Wiedemann, 1818. Four further species were described in the 19th century by Jaennicke, Macquart and Bigot (three from females only). Stein, in 1913, described two further species (*singularis* and *maculigena*). Malloch (1924) described three species, two of which are junior synonyms. The last of the nine species that comprised the list of afrotropical *Anthomyia* prior to this revision was *A. punctipennis* Wiedemann, an introduced species from the Neotropical Region. The last major taxonomic works on the genus were by Emden (1941 1951).

The types of Walker's and Malloch's species are in BMNH and have been revised. Stein's 1913 types were in MNM and were destroyed in 1956. Jaennicke's types are in FSF, while Bigot's types are in UMO and Macquart's types are in MNHNP. I have examined most of these types; where I have not seen them, they have recently been studied by Dr V. Michelsen, who kindly supplied me with information where this was not already published.

I mentioned in my revision of afrotropical *Emmesomyia* (Ackland 1995: 2) that no detailed drawings of the male or female genitalia of African species of that genus had been published; the same applies to species of afrotropical *Anthomyia.* I have used several characters of the male postabdomen of *Anthomyia* species, for example, the central process on synsternite (6+7), which were not appreciated until Michelsen & Báez (1985: 285) drew attention to them.

The males of most species can be fairly easily recognised by a combination of character states, based on the aristal hair length, costal spine length, and the extent of the black scutal markings (*pluvialis* section), or the wing markings (*punctipennis* section). Confirmation is provided by character states of the 5th sternite and the genitalia. Colour of legs and abdomen (dark or pale) have proved to be less reliable. *Anthomyia* females are more difficult to identify. Griffiths (2001) introduced a new character (a transverse sheen stripe on the parafacials at level of frontal angle and on the genae), which is present in *Anthomyia* females, but absent in females such as *Lasiomma*, which are otherwise similar to females of the *punctipennis* section. The structure of the female postabdomen is very similar in most species. The key to females needs to be used with caution, especially in the species I have provisionally included in the *A. abyssinica* superspecies, some females of which are unknown.

The larvae of *Anthomyia* species have been reported from vertebrate faeces, decomposing fungi, rotting vegetable matter, bird nests and carrion. African records include a species (possibly distinct from *A. benguellae* but not described in this paper) breeding in rock hyrax (*Procavia capensis*) dung in Namibia; a male of *A. parapluvialis* was bred from gelada baboon (*Theropithecus gelada*) dung in Ethiopia; *A. maculigena* larvae are recorded from ripe coffee beans and vegetable marrow; *A. whitei* from gelada baboon dung in Ethiopia; *A. amoena* from an old snail, from cormorant and little egret nests, and from chicken dung. As far as is known, all *Anthomyia* species are oviparous.

MATERIALS AND METHODS

This study was based on material from the following museums (codens in parentheses): Forschungsinstitut Senkenberg, Frankfurt, Germany (FSF). Hope Entomological Collections, University Museum of Natural History, Oxford, U. K. (UMO). Magyar Nemzeti Muzeum, Budapest, Hungary (MNM). Muséum National d'Histoire Naturelle, Paris, France (MNHNP). Natal Museum, Pietermaritzburg, South Africa (NMSA). National Museum of Wales, Cardiff, U. K. (NMWC). Naturhistorisches Museum, Vienna, Austria (NMW). The National Museum of Namibia, Windhoek, Namibia (NMWN). The Natural History Museum, London, U. K. (BNMH). Zoological Museum, University of Copenhagen, Denmark (ZMUC).

Morphological terminology is based mainly on McAlpine (1981). Label data of holotypes (including described and new species) are quoted as they appear; a single slash (/) indicates the end of a line of data. Supplementary information is given in square brackets. The citation of 'other material examined' was standardised for dates of collection and other data, and therefore may not be exactly as found on the specimen labels.

Localities in South Africa are listed under the nine provincial names adopted in 1994. The former Cape Province now comprises the Eastern Cape, Western Cape and Northern Cape. The former Transvaal Province includes the Northern Province, NorthWest, Mpumalanga and Gauteng. The former Natal Province is now known as KwaZulu-Natal, and the Orange Free State as Free State.

Dissected specimens have their genitalia mounted either in glycerol in a plastic tube on the staging pin, or in some cases in Canada Balsam or DMHF (water soluble resin) on card or plastic slips. Drawings were made with a camera lucida. The scale on the figures represents 0.1 mm, unless otherwise stated.

The following abbreviations are used in the descriptions:
Legs: f1 = fore femur; f2 = mid femur; f3 = hind femur; t1 = fore tibia; t2 = mid tibia; t3 = hind tibia. Leg setae: a = anterior; p = posterior; d = dorsal; v = ventral; ad = anterodorsal; pd = posterodorsal; av = anteroventral; pv = posteroventral.

GENERIC SYNONYMY

Anthomyia Meigen, 1803

Anthomyia Meigen, 1803. Type species: *Musca pluvialis* Linnaeus, 1758, by designation of Latreille (1810).

Craspedochoeta Macquart, 1851. Type species: *Anthomyia punctipennis* Wiedemann, 1830, by monotypy. Synonymy after Michelsen (1997: 39).

'*Craspedochaeta* Macquart.' emendation or error for *Craspedochoeta* by von Marschall (1873).

Only those generic names applicable to the afrotropical fauna are included here; for a full list of synonyms and references see Griffiths (2001: 2184).

Michelsen's (1997: 39) proposed expansion of *Anthomyia* (*s.l.*) to include *Craspedochoeta* (and other genera such as *Chelisia*) was accepted by Griffiths on the basis of their close structural similarity, and I follow it here. Constitutive (apomorphous) characters of *Anthomyia* are found mainly in the male genitalia, and were listed by Griffiths as follows: the 5th sternite processes lack strong outer lateral setae and are more or less vertically oriented distally; synsternite (6+7) with a centrally, posteriorly directed, process (very small in a few afrotropical species, and occasionally absent in some specimens); inner lobe of the (apically cleft) surstylus flattened and bearing a few spines or spinules; distal section of the aedeagus sclerotised on dorsal surface only, in most species with a dorsal process at or near base (absent in two afrotropical species, probably secondarily); acrophallus represented by a downcurved sclerite; lower surface of costa setulose. The female postabdomen forms a retractile ovipositor with tergites 7 and 8 weakened centrally, similar to other species of anthomyiids which are oviparous and have saprophagous larvae. All the afrotropical species have these character states.

The following character states are common to all *Anthomyia* species, and are omitted from the descriptions: eyes without pubescence; face flat centrally and not constricted ventrally; mouth margin not strongly projecting (in lateral view reaching or only slightly exceeding level of parafrontal angle); palpi not expanded; notopleural depression bare except for the two long setae; prosternum, anepimeron and meron bare; costa setulose ventrally; male abdomen more or less dorsoventrally compressed, with strong setae on posterior margins of 2nd to 5th tergites, but no developed median rows of setae; 6th tergite bare but pregenital segment setulose; female postabdomen forming an elongate retractile ovipositor with 7th and 8th tergites divided into pairs of lateral plates.

Griffiths recognised six sections of *Anthomyia* (*A. cannabina*, *A. mimetica*, *A. xanthopus*, *A. punctipennis*, *A. monilis* and *A. pluvialis* sections). All except the *xanthopus* section occur in the Nearctic Region. Only two of these sections occur in the Afrotropical Region, the *punctipennis* section and the *pluvialis* section.

CHECKLIST OF AFROTROPICAL *ANTHOMYIA* SPECIES

(a) **punctipennis** section

liturata subsection

simensis (Jaennicke, 1867). Type locality: Ethiopia
  sinensis: Stein, 1913. Error
  sinensis var. *intensa* Malloch, 1924. **Syn. n.** Type locality: Kenya
verecunda sp. n. Type locality: South Africa, KwaZulu-Natal, Weenen

punctipennis subsection

punctipennis Wiedemann, 1830. Type locality: Uruguay: Montevideo

(b) **pluvialis** section

pluvialis superspecies

benguellae Malloch, 1924. Type locality: Namibia, Benguella
  sensua Curran, 1927. Type locality: South Africa, KwaZulu-Natal, New Hanover, synonymy after Emden, 1941*b*: 261.
  inda Ackland & Pont, 1977. **Syn. n.** Type locality: NW India, Kasauli
tempestatum Wiedemann, 1818. Type locality: South Africa, Cape of Good Hope
parapluvialis sp. n. Type locality: South Africa, Western Cape

ornata superspecies

ornata (Bigot, 1885). Type locality: South Africa, KwaZulu-Natal
maculigena Stein, 1913. Type locality: South Africa, Durban
  griseobasis Malloch, 1924. **Syn. n.** Type locality: South Africa, KwaZulu-Natal, Estcourt
whitei sp. n. Type locality: Ethiopia, Prov. Gojjam
stuckenbergi sp. n. Type locality: South Africa, KwaZulu-Natal, Drakensberg Mts

amoena superspecies

amoena (Macquart, 1851). Type locality: Mauritius
  fasciata Walker, 1858. **Syn. n.** Type locality: South Africa, KwaZulu-Natal.
latilamina sp. n. Type locality: Kenya, Nanyuki

abyssinica superspecies

abyssinica Jaennicke, 1867. Type locality: Ethiopia
  spinigera Malloch, 1924. **Syn. n.** Type locality: Kenya
singularis (Stein, 1913). Type locality: Tanzania, Kilimandjaro
malagasica sp. n. Type locality: Madagascar, Perinet
subabyssinica sp. n. Type locality: South Africa, KwaZulu-Natal, Weenen
acutula sp. n. Type locality: South Africa, Western Cape, Dwyka River
subornata sp. n. Type locality: South Africa, KwaZulu-Natal, Estcourt
concava sp. n. Type locality: Uganda, Ruwenzori Range

KEY TO AFROTROPICAL SPECIES OF *ANTHOMYIA* (MALES)

1 Proepisternum (propleural depression) bare; dorsal surface of thorax not strongly patterned (at most with brownish longitudinal vittae); apical setae of cercal plate not spiniform (Figs 1, 12, 21); wing with distinct patches or bands of clouding on both crossveins (Figs 8, 20, 28) (*punctipennis* section) 2

– Proepisternum setulose or pilose (sometimes only 1–2 fine hairs present); dorsal surface of thorax strongly patterned with postsutural black spots or a crossband, contrasting with silvery grey areas (e.g. Fig. 29); apical setae of cercal plate spiniform (e.g. Fig. 34); wing without patches or bands on crossveins (*pluvialis* section) 4

2 (1) Pregenital sclerite contrastingly shining (undusted); no patch of clouding at apex of R_1 near costa (e.g. Fig. 8); dorsal process of distal section of aedeagus placed some distance from base (e.g. Fig. 6); central process on synsternite (6+7) either large and bilobed (Fig. 7), or flat and apically widened (Fig. 18) (*liturata* subsection) 3

– Pregenital sclerite densely dusted; a patch of clouding adjacent to costa at apex of R_1 (Fig. 28); dorsal process of distal section of aedeagus subbasal (Fig. 26); central process on synsternite (6+7) tongue-like (Fig. 27) (*punctipennis* subsection) .... **punctipennis** Wiedemann

3 (2) Wing with a patch of clouding on membrane near base between R and M (Fig. 8); dorsal surface of distal section of aedeagus with a slight median swelling (in lateral view) distal to the dorsal process (Fig. 6); processes of 5th sternite with longer apical setae (Fig. 3); cercal plate twice as long as wide, tapering to a narrow apex (Fig. 1); seta on the postgonite arising from a narrow extended ventroapical corner (Fig. 5); central process on synsternite (6+7) large, bilobed almost from base (Fig. 7) .... **simensis** (Jaennicke)

– Wing without a patch of clouding on membrane between veins R and M (though the fork of R may be darkened) (Fig. 20); dorsal surface of distal section of aedeagus without a swelling, curving smoothly in distal two-thirds (Fig. 17); processes of 5th sternite with only short setae (Fig. 14); cercal plate about 1.5 times as long as maximum width (Fig. 12); the seta on the ventroapical corner of the postgonite arising from a right angled corner (Fig. 16); central process on synsternite (6+7) flat, widening distally, the apical corners narrowly produced into two small membranous filaments (Fig. 18) .... **verecunda** sp. n.

4 (1) Dorsal surface of thorax with 3 wide black longitudinal vittae which are fused in front of suture, the median vitta reaching scutellum (Fig. 164); pleura also with a longitudinal vitta which runs from below post pronotal lobe to the posterior spiracle (Fig. 165); process of 5th sternite with a small membranous lobe; dorsal surface of distal section of aedeagus with a small triangular process (Fig.171) **singularis** (Stein)

– Dorsal surface of thorax without longitudinal vittae, but with either discrete postsutural spots (e.g. Fig. 29) or a continuous dark postsutural crossband (e.g. Fig. 50) 5

5 (4) Dorsal surface of thorax postsuturally with either 3 (Fig. 29) or 5 (Fig. 102*a*) discrete black or brown spots which are separated by grey dust, or if these spots

are narrowly joined, they then form a continuous crossband but with the anterior and posterior margins deeply indented, and the band becomes narrower above wing base (e.g. Figs 31) 6

– Dorsal surface of thorax with a continuous dark postsutural crossband with the anterior and posterior margins fairly straight or curved (e.g. Fig. 95); if in doubt and the margins are somewhat sinuous (e.g. Fig. 114), the dark spot on vibrissal angle reaches the eye margin (*malagasica*, *abyssinica*, *stuckenbergi*) 9

6 (5) Dorsal surface of thorax either with 5 postsutural spots (Fig. 102*a*), the median one almost reaching prescutellar acrostichals, and is widened posteriorly with a straight margin, or these spots are narrowly joined near suture, creating a distinctive shape (Fig. 104); membranous lobes on processes of 5th sternite large and wide (Fig. 108); postgonite with setula placed on inner surface, but ventroapical corner not expanded (Fig. 109) .... **whitei** sp. n.

– Dorsal surface of thorax with 3 postsutural spots (or 3 spots narrowly joined); dark spot on vibrissal angle not continued across genal groove to reach eye margin; wing with costal spine(s) hardly differentiated from anterior spinules; arista with longest hairs not longer than basal diameter of arista 7

7 (6) Membranous lobes on processes of 5th sternite large, rather square ended, in lateral view strongly projecting ventrally, more or less at right angles to plane of 5th sternite, and with a gap between the basal and apical setae (Fig. 37); apical setae of processes rather long; 4th sternite with long dense marginal setae laterally and posteriorly (Fig. 36); arista of normal length, gradually tapering from base to apex, with distinct but short hairs (equal to diameter of arista at base); surstylus in lateral view longer, especially distal half (Fig. 35) .... **benguellae** Malloch

– Membranous lobes on processes of 5th sternite either very small (Fig. 55), or if larger, directed posteriorly rather than ventrally, apically round (Fig. 73); apical setae of processes shorter; no gap between basal and apical setae; 4th sternite with shorter and sparser marginal setae (e.g. Fig. 54); arista shorter, and swollen basally, rather abruptly narrowing in basal quarter, almost bare; surstylus in lateral view shorter and more robust (Figs 53, 70), distal half wider; distal section of aedeagus more strongly flexed (Figs 57, 75) 8

8 (7) Membranous lobes of processes of 5th sternite small, not directed posteriorly, the apex of the lobe not being the most posterior part of the sternite in lateral view, and over reached by the apex of the process (Fig. 55); cercal plate longer, apex abruptly narrowed and produced (Fig. 52); surstylus in lateral view more robust, distal half wider (Fig. 53); distal section of the aedeagus strongly flexed, concavity of the dorsal surface forming a right angle (Fig. 57); pregonite very strongly expanded distally (Fig. 56); postgonite with a slightly expanded seta which is placed on inner surface close to the hook-like dorsal extension (Fig. 56); central process of synsternite (6+7) bilobed but not diverging, apparently microscopically pilose (Fig. 58) .... **tempestatum** Wiedemann

– Membranous lobes of 5th sternite processes larger but directed more or less posteriorly in lateral view, and overreaching the tips of the processes; the lower surface of the process either straight, or only weakly concave; the short setae continuous, without a gap (Fig. 73); surstylus in lateral view less robust (Fig. 70); distal section of aedeagus less flexed, concavity of dorsal surface forming an obtuse angle (Fig. 75); postgonite with a more expanded seta; central process of synsternite (6+7) large, bilobed, with the arms diverging and foliate (Fig. 76) .... **parapluvialis** sp. n.

9 (5) Dorsal surface of thorax with the darker pattern consisting of rather shining brownish orange presutural spots and a wide postsutural crossband (it is not certain if this is the normal condition, or if it is due to immaturity; the genitalia are distinctive); cercal plate with concave margins in distal third, in lateral view projecting some distance beyond the surstyli (Fig. 221); processes of 5th sternite short, widely separated, without membranous lobes or at least they are not visible in lateral view (Fig. 223); 4th sternite long and narrow (Fig. 222); pregonite much smaller than postgonite (Fig. 224); distal section of aedeagus nearly straight in lateral view (Fig. 225); central process on synsternite (6+7) consisting of a sharply pointed spike (Fig. 226) .... **concava** sp. n.

– Dorsal surface of thorax with the normal blackish markings on a silvery grey ground colour; genitalia different 10

10 (9) Arista plumose, total width of hairing between three-quarters and fully the width of first flagellomere (Figs 151–154), and costal spine(s) and adjacent spinules very long, fully as long as upper crossvein (Figs 155–158); prealar seta as long as anterior notopleural seta, and the other scutal setae also rather long; legs often longer than usual, especially hind legs .... **abyssinica** Jaennicke

– Arista with total length of hairing generally not more than half length of first flagellomere (if more e.g. *amoena*, then costal spine(s) hardly differentiated from anterior costal spinules) 11

11 (10) Arista plumose, total width of hairing nearly equals width of first flagellomere; costal spine(s) not or hardly differentiated from anterior spinules, all very short; first flagellomere long and narrow, over 3 times as long as wide; parafacials narrow; dark spot on vibrissal angle not reaching eye margin; eye margins on frons nearly touching, separated by diameter of anterior ocellus; inner margins of processes of 5th sternite pilose as well as setose (Fig. 127); surstylus in lateral view gradually downcurved with the distal two-thirds of equal width (Fig. 126); pregonite small in relation to postgonite (Fig. 129); postgonite hardly excavated just distal to the widely expanded setula; distal section of aedeagus slender and rather abruptly bent medially (Fig. 130) .... **amoena** (Macquart)

– Aristal hairing not longer than half width of first flagellomere, or arista almost bare… 12

12 (11) Presutural spots on thorax very small and isolated (Fig. 133); postsutural band on thorax narrower, with some grey dusting between anterior margin and suture (Fig. 133); inner margins of processes of 5th sternite with short setulae but not pilose (Fig. 137); surstylus in lateral view medially wide (more so than in any other species of *Anthomyia*) but abruptly tapered apically (Fig. 136); pregonite larger in relation to postgonite (Fig. 139); postgonite deeply excavated just beyond setula (Fig. 139); distal section of aedeagus gradually curved .... **latilamina** sp. n.

– Not all the above characters present 13

13 (12) Cercal plate in lateral view completely convex in apical two-thirds (apex not upturned), with the apical spiniform setulae widely spaced (Fig. 117); postsutural black crossband of thorax rather sinuate on posterior margin (Fig. 114); surstylus narrow medially in both lateral and caudal (dorsal) view (Figs 116, 117); postgonite with a slender setula (Fig. 120); arista with hairs that are shorter than diameter of base .... **stuckenbergi** sp. n.

– Cercal plate in lateral view with apical third concave (apex upturned) (Fig. 85) or rather straight and strongly projecting beyond surstyli (Fig. 202) 14

14 (13) Membranous lobes of 5th sternite processes large, sclerotised to a greater or lesser extent and twisted obliquely towards the centre line of the sternite (Fig. 86); arista with total width of hairing about two-thirds width of first flagellomere; 4th sternite with long dense setae on lateral and posterior margin (Fig. 86); setae on inner basal margins of processes of 5th sternite long, meeting or crossing on centre line (Fig. 86) 15

– Membranous lobes of 5th sternite either extremely small or not visible in lateral view (Fig. 194), or if larger, then not sclerotised; arista either bare, pubescent or plumose 16

15 (14) Dorsal surface of thorax extensively dark, presutural area with shifting black pattern which becomes more extensive when viewed from a low angle in front, extending from suture laterally to anterior margin of thorax; postsutural black crossband wide, almost reaching 3rd postsutural dorsocentral seta (Fig. 82); postgonite with a moderately expanded seta arising from the inner surface (Fig. 88); pregonite shorter, with the apical setae equally placed on distal margin (Fig. 88); legs generally dark .... **maculigena** Stein

– Dorsal surface of thorax more or less orange in ground colour, partly translucent, with the presutural spots not reaching 2nd presutural dorsocentral seta (Fig. 95), often united behind head; pleura in places translucent orange in ground colour (specimens of *ornata* from Namibia have much reduced presutural spots and a narrower postsutural crossband (Fig. 97); genitalia not differing from typical *ornata* from Natal); postgonite with slender seta arising from inner surface behind an expanded lower ventroapical corner (Figs 99, 100); pregonite concave on dorsal surface, longer and with the two apical setae placed on dorsal half of posterior margin (Figs 99, 100); abdomen and legs more or less orange (especially coxae, trochanters and bases of femora) .... **ornata** (Bigot)

16 (14) Distal section of aedeagus without a basal dorsal process (Fig. 196) 17

– Distal section of aedeagus with a basal dorsal process (Fig. 212) 18

17 (16) Setae on inner basal margins of 5th sternite processes longer, and with the membranous lobe larger (Figs 203, 204); in lateral view this lobe has a more or less concave posterior margin; surstylus in lateral view parallel-sided beyond the median constriction (Fig. 202); central process on synsternite (6+7) bilobed from base, larger and foliate (Fig. 208) .... **acutula** sp. n.

– Setae on inner basal margins of 5th sternite processes shorter (Fig. 193), and with the membranous lobe in lateral view small, hardly visible (Fig. 194); surstylus in lateral view more rounded (Fig. 192); central process on synsternite

(6+7) very small (sometimes absent) either flat and hardly bilobed, or weakly bilobed in distal half (Figs 197–199) .... **subabyssinica** sp. n.

18 (16) Presutural spots on thorax large, forming an inverted V behind head (Fig. 172); setae on inner basal margins of processes of 5th sternite longer, and apical setae long (Fig. 176); dorsal process of distal section of aedeagus long and narrow (Fig. 179) .... **malagasica** sp. n.

– Presutural spots on thorax small and isolated (Fig. 209); setae on inner basal margins of process of 5th sternite shorter (Fig. 213); dorsal process of distal section of aedeagus short and wide at base (Figs 216, 217); central process on synsternite (6+7) bilobed from base, foliate (Fig. 218) .... **subornata** sp. n.

KEY TO AFROTROPICAL SPECIES OF *ANTHOMYIA* (FEMALES)

1 Proepisternum bare; dorsal surface of thorax not strongly patterned (or at most with brownish longitudinal vittae); wing with distinct patches of clouding on both crossveins; only 2 spermathecae 2

– Proepisternum setulose; dorsal surface of thorax strongly patterned, either with black or brown spots or longitudinal vittae; 3 spermathecae; wing without patches of clouding 4

2 (1) Wing with a dark cloud on near costa at apex of $R_{1;}$ arista only pubescent; legs largely yellow, except for tarsi .... **punctipennis** Wiedemann

– Wing without a dark cloud near costa at apex of R_1; arista plumose, total width of hairing more than half width of first flagellomere; legs darker, only tibiae obscurely yellowish 3

3 (2) Wing with a small patch of infuscation on membrane near base between R and M .... **(simensis)** Jaennicke

– Wing without this infuscation on membrane between R and M (though the fork of R is darkened) .... **verecunda** sp. n.

4 (1) Arista bare, or with hairs which are not longer than diameter of base 5

– Arista with hairs longer than diameter of base 8

5 (4) Dorsal surface of thorax with a complete postsutural crossband, the margins of which are slightly sinuate, but the band is not formed from discrete spots which have narrowly fused; presutural spots rather square ended posteriorly; orbital setae strong, anterior pair often arising from dark spots ... **stuckenbergi** sp. n.

– Dorsal surface of thorax with either 3 or 5 dark postsutural spots, which may be narrowly fused together, in which case the margins of the band are very sinuate, and become narrower laterally (over wing base) 6

6 (5) Dorsal surface of thorax with 5 discrete postsutural black spots, separated by grey dusting, of if these spots are fused, the resultant pattern is distinctive, with anterior and posterior margins extended on median line (similar to male, Fig. 104); katepisternal setae 2 + 2, both ventral setae short .... **whitei** sp. n.

– Dorsal surface of thorax with 3 discrete postsutural black spots, or if these spots are narrowly joined, the resultant crossband has very sinuate margins; katepisternals 1 + 2 7

7 (6) Larger species, wing length about 5mm; arista longer and gradually tapering,

with hairs as long as basal diameter; ovipositor longer (Fig. 46) .... **benguellae** Malloch

– Generally smaller species, wing length about 4 mm; arista shorter, with swollen base which rather abruptly tapers in basal quarter, almost bare; ovipositor shorter (Fig. 48) .... **tempestatum** Wiedemann, **parapluvialis** sp. n.

8 (4) Dorsal surface of thorax with a black pattern consisting of 3 wide postsutural longitudinal vittae which extend from the scutellum to suture, and fuse together in front of suture (as Fig. 164) .... **singularis** (Stein)

– Dorsal surface of thorax with a complete postsutural dark crossband 9

9 (8) Total width of aristal hairing equal to width of first flagellomere 10

– Total width of aristal hairing at most two-thirds width of first flagellomere 11

10 (9) Wing with costal spine(s) very long, at least as long as upper crossvein (sometimes longer), and the adjacent spinules (especially proximal ones) also rather long; presutural black spots on thorax large, V-shaped, reaching 2nd presutural dorsocentral seta; scutal setae rather long ...... **abyssinica** Jaennicke

– Wing with costal spine(s) small, hardly differentiated from the adjacent spinules (not much longer than costal width); thorax with presutural spots only reaching 1st presutural dorsocentral seta .... **amoena** (Macquart)

11 (9) Total width of aristal hairing two-thirds width of first flagellomere; anterior pair of orbital setae (or only anterior pair) with dark spots around base of setae, and frontal stripe often with a darker suffusion stripe at same level 12

– Total width of aristal hairing not more than one -third width of first flagellomere 13

12 (11) Legs and thorax mainly dark .... **maculigena** Stein

– Legs (especially femora basally), thorax and abdomen partly translucent orange .... **ornata** (Bigot)

13 (11) Dorsal surface of thorax with the (usual) black spots and crossband orange or brownish; ground colour of thorax, abdomen and legs partly translucent orange; prealar seta longer than posterior notopleural seta .... **concava** sp. n.

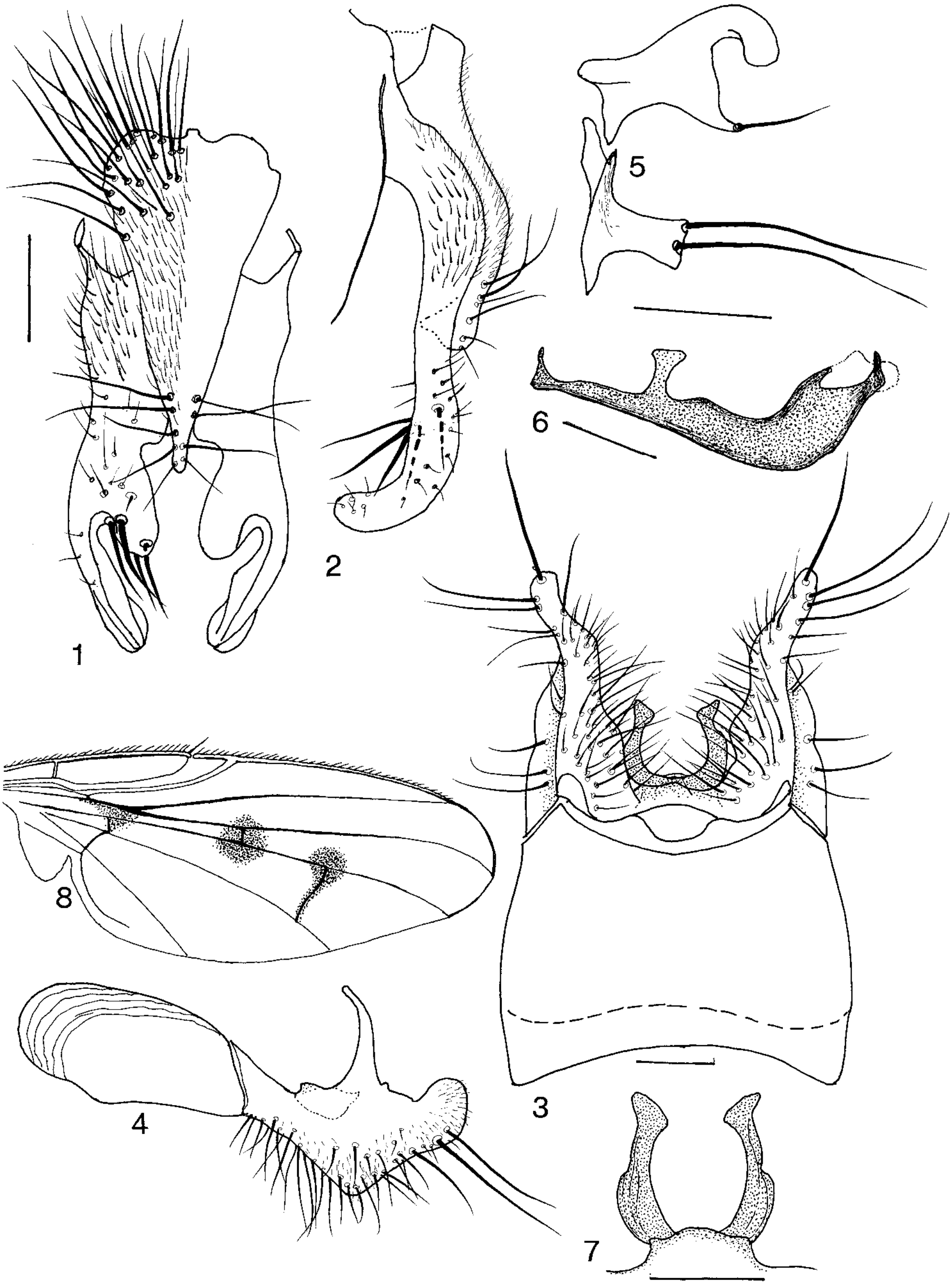
– Dorsal surface of thorax with the normal black pattern; prealar seta shorter .... **malagasica**, **subabyssinica**, **acutula**, **subornata** spp. n.

TAXONOMY

(a) *Anthomyia punctipennis* Section

♂♀ : Wing with crossveins clouded; proepisternum (propleural depression) bare. ♂ with the apical setulae on the cercal plate not modified into spinules (flattened setulae); ♀ with two spermathecae.

Griffiths's provisional proposal to divide the *A. punctipennis* section into two subsections (the *liturata* and *punctipennis* subsections) applies to the afrotropical species; one of the three species (*punctipennis*) is an introduction from the Neotropical Region, the two remaining endemic species (which belong to the *liturata* subsection) probably originate from the Palaearctic Region, where this subsection predominates.



Figs 1–8. *Anthomyia simensis* (Jaennicke) (Kenya). 1–7. ♂ terminalia. 1. Cercal plate and surstyli, caudal view. 2. Ditto, lateral view. 3. 5th sternite, ventral view. 4. Ditto, lateral view. 5. Gonites. 6. Distal section of aedeagus. 7. Central process of synsternite (6+7). 8. Wing.

Anthomyia liturata subsection

♂♀ : Wing without clouding on costa near apex of R_1. ♂: pregenital sclerites contrastingly shining (undusted). This subsection includes *simensis* (Jaennicke) and *verecunda* sp. n.

Anthomyia simensis (Jaennicke, 1867), **comb. n.**

(Figs 1–11)

Hylemyia simensis Jaennicke, 1867: 372; Stein, 1902: 137; Bezzi, 1908: 96; Speiser, 1910: 165; Stein, 1919: 151; Speiser, 1924: 103.
Hylemyia sinensis: Stein, 1913: 557; Stein, 1914: 134; Stein, 1918: 199. Error.
Hylemyia sinensis var. *intensa* Malloch, 1924: 263. **Syn. n.**
Hylemyia pullula intensa: Emden, 1941*b*: 267; Emden, 1951: 364.
Hylemyia (*Craspedochaeta*) *pullula intensa*: Emden, 1956: 530.

Holotype ♂ of *simensis*: ETHIOPIA [Abyssinia]: (Rüppell). In FSF. Not examined by me; examined (with genitalia dissection) by Dr V. Michelsen (unpublished), who sent me drawings of the genitalia.

Holotype ♂ of *simensis intensa*: KENYA: 'Holotype' [circular label with red perimeter]; 'Brit. E. Africa / Kijabe Escarp. / 28.xii.1911–5.i.1912 / 7–8,000 ft / Dr W. J. Radford / bamboo forest' [rectangular white card]; '*Hylemyia sinensis* / var *intensa* / Type / det. J. R. Malloch' [rectangular white card with black perimeter]. Revised during present study. The holotype is rather greasy, left hind tarsus missing, the abdomen has been re-attached with glue.

Other material examined: ETHIOPIA: 1♂, Wagira, Gava mulata, no date, G. Kristensen, ex Wainwright coll. (BMNH). KENYA: 3♂3♀**,** Aberdare Range, Mt. Kinangop, 10000 ft, 26.x.1934, F. W. Edwards, B. M. E. Afr. Exp. (BMNH); 2♂2♀, Aberdare Range, Nyeri Track, 10500–11000 ft, 28.x.1934, J. Ford, B. M. E. Afr. Exp. (BMNH); 1♂, same data, F. W. Edwards (BMNH); 1♂, Mt. Elgon, alpine zone, 12000–13000 ft, ii.1935, F. W. Edwards, B. M. E. Afr. Exp. (BMNH); 1♂2♀, same data but heath zone, 10500–11500 ft (BMNH); 1♀, Ngong, ix.1946, van Someren (BMNH); 1♂1♀, Naivasha, vii.1937, H. J. A. Turner (BMNH); 2♂3♀, Mt. Kenya, Timberless Gap, 9500 ft, 29.vii.1949, J. A. Riley (BMNH). SOUTH AFRICA: *Gauteng*: 1♂, Johannesburg, 19.xii.1948, F. Zumpt (BMNH). TANZANIA: 2♂, no further locality, 7500–11500 ft, B. Cooper (BMNH); 1♂, E Meru, 7000–8000 ft, i.1938, B. Cooper (BMNH). UGANDA: 1♂2♀, Mt. Elgon, Mutangi, viii.1934, 11500 ft, J. Ford (BMNH); 4♂3♀, Imatong Mts, ii.1936, 10000 ft, Dr R. Buxton (BMNH).

Male:

Colour: Interfrontalia, parafrontalia and genae varying from brown to blackish (with rather thin shifting silvery grey dusting); parafrontals opposite lunule with a very indistinct darker greyish shifting sheen stripe which extends from lunule to level of arista, and a greyish shifting spot in vibrissal angle which extends above genal groove to reach eye margin when viewed in profile; face and occiput blackish (with normal dusting). Antennae entirely dark brown to blackish. Palpi dark brown to black; arista brownish at base; prementum dark brown, thinly dusted. Thorax densely dusted light grey (over dark ground-colour) with 3 wide, dark brownish vittae, which become when viewed from in front lighter matt bronzy brown; median vitta either filling space between dorsocentral setae and continuing onto disc of scutellum, or sometimes only as wide as space between acrostichal setae; lateral vittae equally wide and extending from the post pronotal lobe to scutellum or even onto sides of scutellum. Pleura rather thinly greyish dusted, with browner shifting and slightly shining patches. Abdomen largely light grey dusted over dark ground-colour, with a wide (half width of abdomen) dark brown central vitta on all tergites, anterior and lateral margins of tergites narrowly darkened brownish. Pregenital sclerite contrastingly shining blackish; hypopygium and 5th sternite brownish, rather finely dusted. Wing (Fig. 8) with membrane slightly brownish tinged basally; with conspicuous patches of brownish clouding around upper crossvein, and on either end of lower crossvein, the circular patch on junction of lower crossvein with M_{1+2} large and extensive; also some indistinct clouding near base of wing on membrane between R_{4+5} and M_{1+2}; squamae paler than wing base with whitish fringes; halteres yellow. Legs entirely dark brown to blackish.

Head: Parafrontalia linear posteriorly, touching just below ocellar tubercle, widening anteriorly to slightly less than width of first flagellomere; eyes practically touching on frons, separated by less than half width of anterior ocellus; genae below lowest point of eye margin 0.20–0.22 times eye-height. 4–5 pairs of parafrontal setae (interspersed with a few fine hairs) on anterior half of distance between antennal base and anterior ocellus; short interfrontal setulae present. First flagellomere slightly more than twice as long as wide (apex not quite reaching lower facial margin); arista short plumose, total width of hairing about two-thirds width of first flagellomere. Prementum about 0.35 times as long as head height.

Thorax: 3 pairs of moderately long presutural acrostichals (the middle the longest at about 0.5 times length of 2nd presutural dorsocentral seta) in rows separated by slightly less than distance from each to adjacent dorsocentral row, without additional setulae in between; acr / dc ratio 10:9:10; posthumerals 1 + 1; prealar about 0.7 times length of posterior notopleural; dorsal surface of scutellum bare centrally; propleural depression bare; katepisternals 2 + 2, lower posterior nearly as long as upper anterior seta; anepisternum with a developed upper anterior setula.

Legs: f2 with row of 6–7 pv, 1 shorter av; f3 with 8 av on whole length, (which are about twice as long as depth of femur), 2 pv; t1 with 1 pv; t2 with 1 ad, 1–2 pd and 2 p/pv; t3 with 2 av, 4–5 ad, 2 pd and 3–4 pv.

Wing: costa with marginal spinules about 1.5 times as long as costal diameter, one of the two before distal break differentiated, 2.5 times longer than the other costal spinules; lower crossvein slightly sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.5 times length of preceding section. Lower squama smaller than upper.

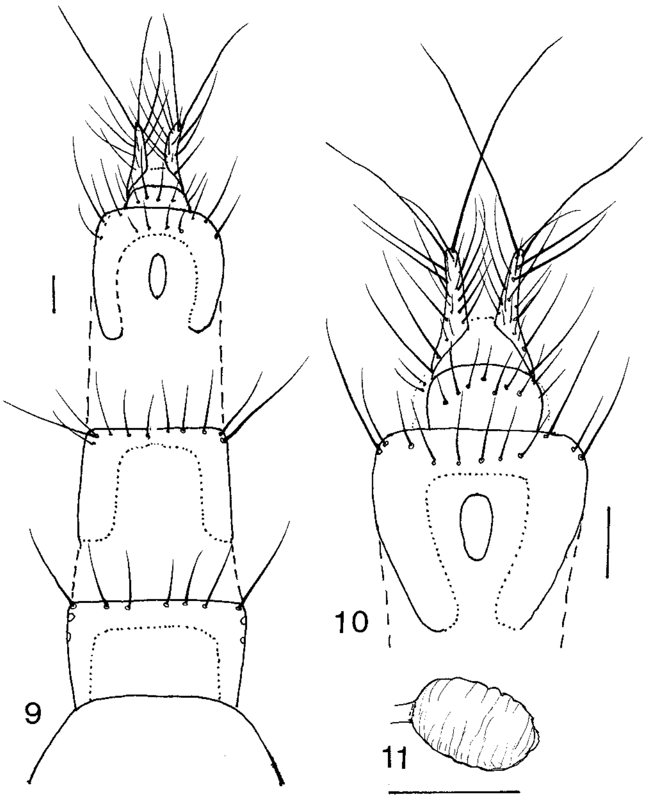
Wing length up to 5.5 mm.

Abdomen: Slightly more than twice as long as wide (2.3), dorsoventrally flattened in basal two-thirds, more or less parallel-sided from 2nd to 4th tergite. 2nd, 3rd and 4th sternites about twice as long as wide; 5th sternite processes (Fig. 3) in ventral view with a few short setae laterally at their bases, otherwise with long multiserial rows of setulae on their sinuate inner margins, and some long apical setae on their divergent apices. Central process of synsternite (6+7) (Fig. 7) with large and divergent arms, with converging apices. Surstylus (Fig. 2) strongly downcurved apically, appearing slender in lateral view, bearing 3–4 short spinules below the angle of its inner lobe. Cercal plate (Fig. 1) twice as long as wide, gradually tapering to a narrow apex, with 4–5 pairs of pairs of subapical setulae, otherwise setulose only on basal half; in profile medially convex. Pregonite (Fig. 5) longer than wide, with 2 straight setulae on distal margin; postgonite (Fig. 5) with a short setula placed on an extended ventroapical corner. Distal section of aedeagus (Fig. 6) with a submedian dorsal process well separated from its base, dorsal margin of distal section just distal to the dorsal process with a slight swelling, the apical third of distal section rather distinctly upturned with an apical acrophallus.

Female:

Colour: Head dark as in male. Thoracic pattern very similar to that of male, median vitta on scutum often not extended onto scutellum. Abdomen with median vitta tending to be broken into spots. Legs dark as in male.

Head: Eyes widely separated (slightly more than their transverse width, ratio 3:5:3); interfrontalia at level of middle ors about 2.5 times as wide as each parafrontal; parafrontalia widening anteriorly to about width of first flagellomere; genae below lowest point of eye margin about 0.36 times eye height. Arista with longer hairs than the male (total width of hairing nearly as long as width of first flagellomere. Parafrontal setae differentiated into 2 pairs of orbital setae and 2 pairs of smaller (inwardly directed) frontal setae; crossed interfrontal setae well developed.



Figs 9–11. *Anthomyia simensis* (Jaennicke) (Kenya). 9–10. ♀ ovipositor, dorsal view. 11. spermatheca.

Thorax: Presutural acrostichal setulae slightly finer and shorter than in male. Katepisternals 2 + 2 (lower posterior as long as upper, lower anterior short and fine).

Legs: t1 with 1 ad and 1 p; t2 with 1 ad, 2 pd and 2 p/pv; t3 with 2 av, 4 ad and 3 pd.

Wing length up to 5.0 mm.

Abdomen: Postabdomen (Figs 9, 10) shorter than preabdomen (0.7–0.8 times). Tergites 6–8 more or less continuously sclerotised across the dorsum posteriorly (where they bear rows of setulae), divided anteriorly into pairs of dorsolateral strips; 8th tergite with a trace of a central strip. 6th and 7th spiracles posteriorly situated on 6th segment. 10th tergite longer than wide, bearing about 6 setulae posteriorly; cerci not very long, with several very long setulae apically. 2 spermathecae (Fig. 11), ribbed, longer than wide (0.1 x 0.07 mm).

Discussion: Jaennicke named this species *simensis*, presumably after the district Simen in Ethiopia (*simenensis* would have been more appropriate). Stein (1902) wrote '*simensis*' when he redescribed Jaennicke's types. In 1913, 1914 and 1918 however, he wrote '*sinensis*' without comment. In his world catalogue (Stein 1919) he reverted to '*simensis*'. As there is no evidence to show that he intended to emend the name, I consider it appropriate to treat the spelling '*sinensis*' as an error, and as such it has no nomenclatural standing. The recently described *Anthomyia sinensis* Zhang & Sun, 1997, is not therefore a homonym. Malloch described *sinensis* [*sic*] var. *intensa* in 1924, based on a single male from Kenya, which differed from specimens (1♂4♀) from Willow Grange, Natal, which he considered to be *simensis* Jaen. *A. simensis* var. *intensa* possessed a 'larger cloud on both crossveins and a brown spot at base of discal cell on the fourth vein which crosses the cell in front of that vein'. Unfortunately there are two distinct species involved, and the true *simensis* is the same species as Malloch's var. *intensa*, and the species which he identified as '*simensis*' from Willow Grange (in BMNH, genitalia examined) is undescribed. It is described in this paper as *verecunda* sp. n.

Emden in 1951 decided that the specimens from Natal, identified by Malloch as *simensis*, did not differ from British specimens of *pullula*, now known by the earlier name of *liturata* (R. D.), and synonymised the two names. He therefore listed the true *simensis* as *pullula intensa*. This is incorrect.

Nearly all the material I have examined from northern and central Africa to as far south as Tanzania are *simensis*. Those from South Africa are *verecunda*. There is however a single male in BMNH (Gauteng, Johannesburg, F. Zumpt) which has the basal patch at the base of the wing and the genitalia of *simensis*, but its appearance is more like *verecunda*. Dr Zumpt was known to receive bred material from other parts of Africa (from bird nests etc.), and it is possible that this specimen may not have been collected in Johannesburg.

Dr V. Michelsen kindly sent me some drawings of the genitalia of the holotype of *simensis*; they agree exactly with the figures of a specimen from Kenya figured in this paper. The longer cercal plate with a narrower apex, and the more strongly curved distal section of the aedeagus (bearing a small swelling dorsally just distal to the dorsal process) are characteristic of *simensis*, which is probably closely related to the Palaearctic species *liturata*. Both species have a similar bilobed central process on synsternite (6+7); *simensis* differs from *liturata* in having a basal wing patch and wider apical part to the distal section of the aedeagus, as well as more strongly infuscated crossveins.

Distribution: The range of *simensis* is from Ethiopia in the north to Tanzania in the south, with the one isolated record from Gauteng (South Africa) mentioned above.

Anthomyia verecunda sp. n.

(Figs 12–20)

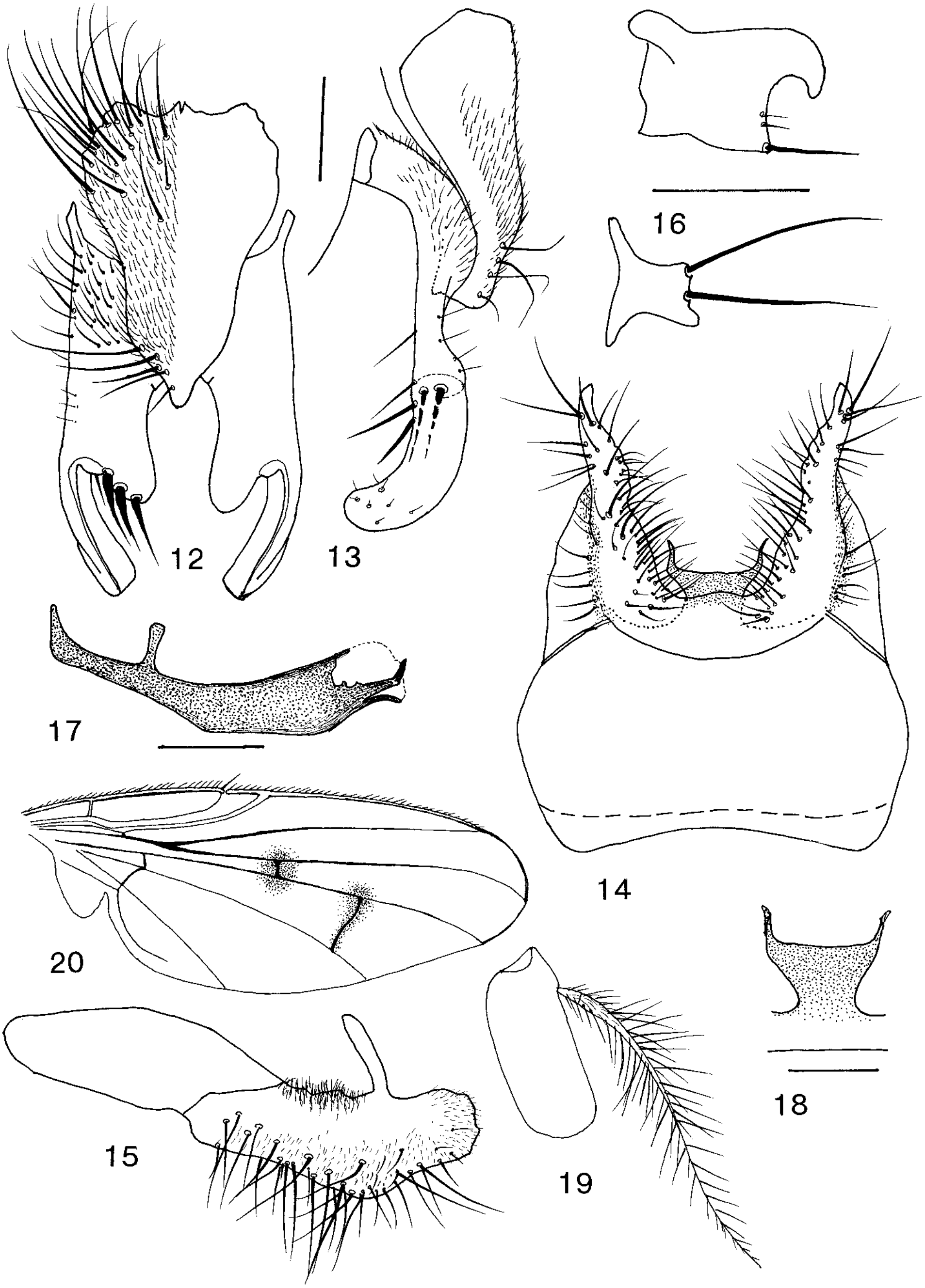
'*Hylemyia sinensis* (Jaennicke)'. Malloch, 1924: 263.
'*Hylemyia pullula pullula* (Zetterstedt)'. Emden, 1941*b*: 267.
'*Hylemyia pullula* (Zetterstedt)'. Emden, 1951: 364.

Holotype ♂: SOUTH AFRICA: *KwaZulu-Natal*: '*Natal* / Weenen Nature Reserve / 28°51'S:29°59'E / Thornveld, dam & camp / 1–4.x.1990, sweep net / A. E. Whittington'; 'HOLOTYPE ♂ / *Anthomyia verecunda* / Ackland' [Rectangular red card]. In NMSA. Paratypes: KENYA: 2♂, Muguga, ix.1969, C. F. Dewhurst (BMNH). SOUTH AFRICA: *Mpumalanga*: 1♀, Mt. Emlembe, near Havelock mine on Barberton Road, 26°55'S:31°07'E, 2531CC, 7.xi.1970, Stuckenberg, 1425 m, montane forest & streams (NMSA). *Gauteng*: 1♂, Johannesburg, 1.v.1950, F. Zumpt (BMNH); 1♂, same locality, 24.i.1952, Paterson (BMNH); 1♂, same locality, 6.i.1953, Paterson (BMNH); 1♂, same locality, 11.i.1953, Paterson (BMNH); 2♀, same locality, 15.i.1953, Paterson (BMNH); 1♂, same locality, 18.i.1953, Paterson (BMNH); 1♂, same locality, 25.ii.1953, Paterson (BMNH); 1♀, same locality, i.1971, F. Zumpt (BMNH); 2♀, Bapsfontein, 25.xi.1954, F. Zumpt (BMNH). *KwaZulu-Natal*: 4♂1♀, Willow Grange, Will Brook, 29.iii.1914, R. C. Wroughton (det. *Hylemyia sinensis* Jaen. by J. R. Malloch) (BMNH); 5♂, same data as holotype (NMSA); 3♂3♀, same locality and date but Malaise trap (NMSA); 1♀, Weenen, 2840 ft, vi–vii.1923, H. P. Thomasset (BMNH); 2♂, same locality and captor but xii.1923 (BMNH); 1♂, same locality and captor but v.1924 (BMNH); 1♂, Pietermaritzburg, 15.xi.1954, F. Zumpt (BMNH); 1♀, Newcastle, xii.1952, F. Zumpt (BMNH); 1♀, Ladysmith, xii.1952, F. Zumpt (BMNH); 1♀, Umtamvuna Nature Res., 31°00'06"S:30°10'38'E, forest margin, 450m, 29.x.1990, Whittington (NMSA); 1♀, Drakensberg Garden area, 2929CA, 13–14.x.1984, J. G. H. Londt (NMSA); 1♂, nr. Lilani, Ahrens district, April 1962, B. & P. Stuckenberg (NMSA); 1♂, Pietermaritzburg, xi.1960, T. Schofield (NMSA); 1♂, Giants Castle Res., Drakensberg, 5800 ft, 18–23.ix.1961, B. & P. Stuckenberg (NMSA). *Eastern Cape*: 1♀, Mountain Zebra Nat. Park, 17–21.xii.1985, 3225AD, Bushveld vegetation, J. G. H. Londt (NMSA); 1♀, Otterford Forestry Reserve, Hankey area, 1–10.xii.1967, 3325CC, B. & P. Stuckenberg (NMSA). *Western Cape*: 1♀, #5, Montagu Pass, 3322Cd, Camfer-George Road, 12.i.1983, SAR Bridge, R. Miller & P. Stabbins (NMSA); 1♀, #3, Cogman's Kloof, 3320Cc, Ashton-Montagu Road, 11.i.1983, along river, P. Stabbins & R. Miller (NMSA); 1♀, Stellenbosch, 8.x.1926, Dr H. Brauns (NMSA); 1♀, Outeniqua Pass, George district, 24.x.1964, B. & P. Stuckenburg (NMSA); 1♀, Rapenburg, Cape Flats, 1–4.x.1920, R. E. Turner (BMNH); 1♀, Mossel Bay, 5–31.xii.1921, R. E. Turner (BMNH); 1♀, same locality, 1.1922, R. E. Turner (BMNH); 2♀, Kloof Nek, Cape Town, 1–2, i.1972, Southern Africa Exp. (BMNH).

Etymology: L. *verecundus* = modest, shy. The name *verecunda* refers to the unobtrusive characters defining this species.

Male: Differs from *A. simensis* as follows:

Colour: Dusting of whole body more greyish olive; parafrontals with the greyish shifting



Figs 12–20. *Anthomyia verecunda* sp. n. (paratype ♂, Johannesburg, Gauteng). 12–18. Terminalia. 12. Cercal plate and surstyli, caudal view. 13. Ditto, lateral view. 14. 5th sternite, ventral view. 15. Ditto, lateral view. 16. Gonites. 17. Distal section of aedeagus. 18. Central process of synsternite (6+7). 19. First flagellomere and arista. 20. Wing.

spot in vibrissal angle often not extending completely to eye margin when viewed in profile. Thorax dusted darker grey, the scutal vittae much less contrasting with the body dusting; median vitta only as wide as space between acrostichal setae; lateral vittae in some specimens less distinct; pleura greyish dusted. Abdomen largely grey dusted over dark ground-colour, with a narrower brown central vitta which is broken into separate triangular spots. Pregenital sclerite contrastingly shining brownish; hypopygium and 5th sternite brownish, rather finely dusted. Wing (Fig. 20) with membrane slightly brownish tinged; with conspicuous but smaller patches of brownish clouding around upper crossvein, lower crossvein clouded along whole length, but the upper junction with M_{1+2} not expanded into a circular spot; no indistinct clouding near base of wing between R_{4+5} and $M_{1+2,}$ although the node at base of R is darkened (but not the wing membrane); squamae hardly paler than wing base. Legs brown with mid and hind tibiae lightened orange to yellow medially.

Head: Arista (Fig. 19) longer plumose, total width of hairing about width of first flagellomere.

Thorax: Prealar slightly shorter, about 0.5 times length of posterior notopleural.

Legs: f2 with row of 3–4 pv.

Wing: costa with marginal spinules shorter, about as long as costal diameter; one of the two spinules before distal break differentiated, twice the length of the other costal spinules.

Wing length up to 5.5 mm.

Abdomen: 5th sternite processes (Fig. 14) without long apical setae on their not so divergent apices. Central process of synsternite (6+7) (Fig. 18) broadly wedge-shaped, with only the apical corners narrowly produced. Surstylus (Figs 12, 13) shorter, and less constricted medially in caudal (dorsal) view. Cercal plate only 1.5 times as long as wide, wider in apical third and then abruptly tapering to a narrow apex. Pregonite (Fig. 16) shorter, postgonite of different shape, with the short setula not placed on an extended ventroapical corner. Distal section of aedeagus (Fig. 17) with dorsal margin just distal to the dorsal process without a slight swelling, the dorsal margin gradually curved.

Female: Differs from the female of *simensis* as follows:

Colour: No clouding on wing membrane near base of wing between R_{4+5} and $M_{1+2,}$ although the node at base of R is darkened (but not the wing membrane); lateral vittae on scutum often hardly visible. Legs, especially mid and hind tibiae and knees extensively orange medially.

Discussion: Compared with *simensis*, the scutum of *verecunda* has the dark brown median and lateral vittae less distinct, and the central vitta narrower, outer borders not extending beyond line of acrostichal rows; the lateral stripes do not reach below level of insertion of the prealar seta (but see below). Lower crossvein suffused with brown which is however not so expanded at junction of lower crossvein and M1+2 into a rounded spot; the anterior small dark suffusion on membrane between root of R and M, which is present in *simensis*, is absent in *verecunda*. Legs blackish brown, but apical half of t2 and t3 indistinctly orange-yellow translucent, also knees paler.

The two males from Kenya, Muguga (the only record outside South Africa) agree with *verecunda* in wing markings (no basal suffusion between root of R and M) and have the genitalia of *verecunda,* especially the central process on synsternite (6+7), but scutal markings approaching *simensis* (longitudinal vittae on scutum wider and much darker). *A. verecunda* is very closely related to the Palaearctic *confusanea* Michelsen, and both species have the same central process on synsternite (6+7); *verecunda* has a much longer haired arista (total width of hairing equal to width of first flagellomere); parafacials narrower (only half width of first flagellomere); scutal vittae more distinct; pregonite with the distal margin less oblique; distal section of aedeagus apically wider in lateral view, and wing with both crossveins more extensively infuscated.

Distribution: Apart from the specimens from Muguga, all the records of *verecunda* are from South Africa.

Anthomyia punctipennis subsection

♂♀ : Wing with separate patches of clouding in addition to the clouding of both crossveins. ♂: pregenital sclerite dusted, not shining. In Africa this subsection includes only the introduced neotropical species *A. punctipennis* Wiedemann (most of the neotropical *Anthomyia* species belong to this subsection).

Anthomyia punctipennis Wiedemann, 1830

(Figs 21–28)

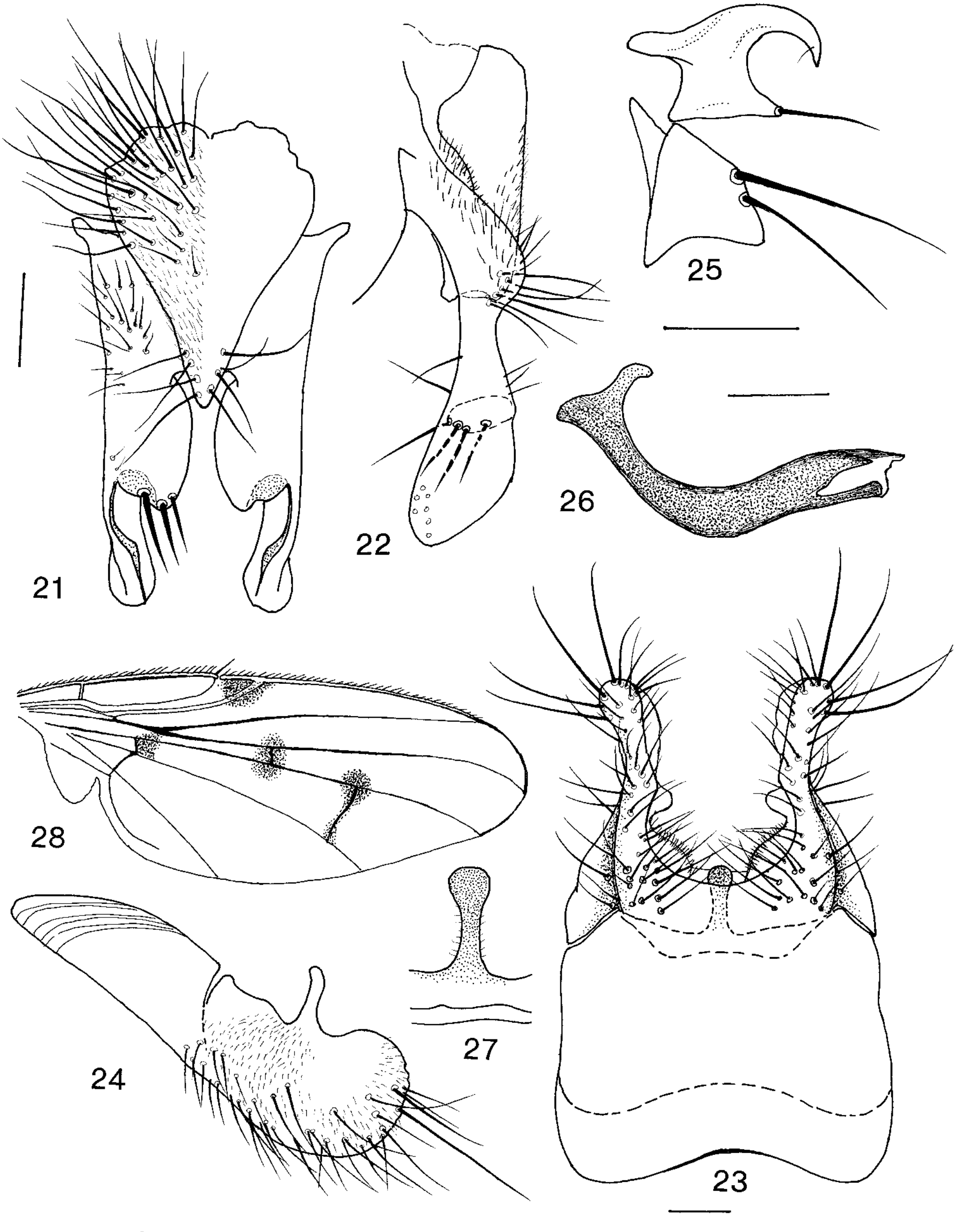
Anthomyia punctipennis Wiedemann, 1830: 435; Michelsen, 1997: 39.
Hylemyia punctipennis: Stein, 1904: 479; Malloch, 1934: 182; Zumpt & Patterson, 1952: 98.
Hylemyia deceptiva Malloch, 1921: 428. Synonymy after Vockeroth, 1976: 348. Primary homonym of *Hylemyia deceptiva* Fitch, 1856 [= *Delia platura* (Meigen, 1826)].
Chortophila punctipennis: Stein, 1907: 285.
Hylemyia (*Craspedochaeta*) *punctipennis*: Albuquerque, 1959: 11.
Craspedochaeta punctipennis: Vockeroth, 1976: 348.

Type(s) of *punctipennis*: ♀ , URUGUAY: Montevideo. Apparently lost, see Michelsen (1997: 39).

Material examined: SOUTH AFRICA: *Gauteng*: 9♂20♀ , Johannesburg, various dates between 17.xii.1948 and 7.xii.1952, and collected on windows, at meat and on stools, Zumpt and Paterson (BMNH). The specimens are labelled 'Paterson' (presumably H. E. Paterson), although the paper recording this species from South Africa was by F. Zumpt & P. M. Patterson.

Male: Differs from *A. simensis* as follows:

Colour: Parafrontals with a greyish shifting spot in vibrissal angle which extends above genal groove but does not quite reach eye margin when viewed in profile; occiput blackish with rather dense grey dusting. Palpi brown with basal third orange-yellow. Thorax densely dusted light grey (over dark ground-colour) with 3 light brownish vittae, which are not strongly contrasting with the grey scutal dust; lateral vittae of same width. Pleura greyish dusted, without darker or shining areas. Abdomen with a wide but indistinct brown central vitta on all tergites, anterior and lateral margins of tergites not darkened. Pregenital sclerite brownish orange, with grey dusting, not shining. Wing (Fig. 28) with membrane slightly brownish tinged with orange veins, with conspicuous patches of brownish clouding around upper crossvein, and on either end of lower crossvein, the circular patch on junction of lower crossvein with M_{1+2} large and extensive; also some indistinct clouding near base of wing on membrane between R_{4+5} and $M_{1+2,}$



Figs 21–28. *Anthomyia punctipennis* Wiedemann. (♂, Johannesburg, Gauteng). 21–27. Terminalia. 21. Cercal plate and surstyli, caudal view. 22. Ditto, lateral view. 23. 5th sternite, ventral view. 24. Ditto, lateral view. 25. Gonites. 26. Distal section of aedeagus. 27. Central process of synsternite (6+7). 28. Wing.

and another patch along costa between subcostal vein and apex of R_1. Legs, including coxae and trochanters, orange, except for fore femora which are dorsally infuscated, and tarsi which are black.

Head: Parafrontalia posteriorly nearly as wide as diameter of anterior ocellus, separated just below ocellar tubercle by a frontal stripe which is 1–1.5 times diameter of anterior ocellus, touching just below ocellar tubercle, widening anteriorly to width of first flagellomere; eyes separated on frons by twice width of anterior ocellus, 2–3 pairs of parafrontal setae on anterior half of distance between antennal base and anterior ocellus, the posterior pair smaller than the cruciate interfrontal setulae. First flagellomere twice as long as wide; arista only pubescent, longest hairs hardly as long as basal diameter.

Thorax: Prealar nearly twice as long as the rather short posterior notopleural; katepisternals 1(2) + 2, lower posterior nearly as long as upper anterior seta, lower anterior fine and hair-like.

Legs: f2 with row of about 4 pv, 0 av; f3 with 5–6 av on whole length, (which are about 1.5 times as long as depth of femur), 2 pv; t1 with 1 pv; t2 with 1 ad, 1 pd and 2p/pv; t3 with 2–3 av, 3–4 ad, 3 pd and 1 pv.

Wing: costa with marginal spinules about as long as costal diameter, the longest of the two before distal break 3 times as long as the other costal spinules (= length of upper crossvein); lower cross-vein slightly sinuate, last section of M_{1+2} 1.5 times length of preceding section.

Wing length up to 6 mm.

Abdomen: 5th sternite processes (Fig. 23) in ventral view with a few short setae laterally at their bases, otherwise with long multiserial rows of setulae on their inner margins, and some long apical setae on their divergent apices; in profile (Fig. 24) the processes are apically widened and rounded. Central process of synsternite (6+7) (Fig. 27) long and narrow, tongue-shaped, apically rounded and slightly expanded. Surstylus (Fig. 22) weakly downcurved, bearing 3–4 short spinules below the angle of its inner lobe; in profile widened apically. Cercal plate (Fig. 21) only 1.3 times as long as wide, gradually tapering to a narrow apex, with 4–5 pairs of pairs of subapical setulae, otherwise setulose only on basal half. Pregonite (Fig. 25) about as long as wide, tapering, with 2 straight setulae on distal margin; postgonite (Fig. 25) with a short setula placed on ventroapical corner, the incision between setula and apex circular. Distal section of aedeagus (Fig. 26) with a sub-basal dorsal process slightly separated from its base, distal section almost the same width throughout, only slightly wider apically, evenly bent along its length.

Female:

Similar to male. Thoracic pattern very similar to that of male; eyes widely separated by about one-third head width; chaetotaxy rather stronger and longer. Wing patches as in male. Ovipositor not examined. Wing length 5 mm.

Discussion: *Anthomyia punctipennis* was first recorded in South Africa by Zumpt and Patterson (1952) from traps baited with human faeces or meat; a total of 285 specimens were caught over a two year period. Malloch (1921: 428) described *Hylemyia deceptiva* from New Zealand and Australia, stating that it was a species closely allied to *punctipennis*. Vockeroth (1976) synonymised these two names, pointing out that as *punctipennis* had not been recorded in New Zealand in 1900, it was probably a species introduced by human agency at some time early in the 20th century into New Zealand, Australia and South Africa.

Michelsen (1997) in a paper dealing with Wiedemann's Anthomyiidae, was unable to find any type material of *punctipennis*. He pointed out that 'there were a number of closely related species in South America, and until this species group was revised, and a neotype designated from the type locality, *Anthomyia punctipennis* Wiedemann should be treated as an unrecognised species'. Albuquerque's interpretation of *punctipennis* (1959) was supported by a description and figures of the genitalia, and South African specimens appear consistent with his description, and so are here recorded under that name. Certain points in his description require clarification with respect to differences from closely related species (some of which may be undescribed). A neotype designation for *punctipennis* is needed in the context of the next revision of South American *Anthomyia* species.

Distribution: Only known in South Africa from Johannesburg.

(b) *Anthomyia pluvialis* Section

♂♀ : Proepisternum (propleural depression) setulose; thorax and abdomen patterned. ♂: Apical setulae of cercal plate short and spiniform. ♀ : Three spermathecae.

Anthomyia pluvialis superspecies

♂: Postabdominal spiracles enlarged. Included afrotropical species are *benguellae* Malloch, *tempestatum* Wiedemann, and *parapluvialis* sp. n. Palaearctic species are *pluvialis* (L.), *procellaris* Rondani, and *avisignata* Suwa.

Anthomyia benguellae Malloch, 1924

(Figs 29–40, 46–47)

Anthomyia benguellae Malloch, 1924: 268, 272; Cuthbertson, 1937: 21; Emden, 1941*b*: 261; Emden, 1951: 353; Pont, 1979: 365; Michelsen, 1980: 287; Michelsen, 1997: 40.

Anthomyia indica Malloch, 1924: 267, 269. Primary homonym of *Anthomyia indica* Walker, 1853: 252.

Anthomyia sensua Curran, 1927: 531; Cuthbertson, 1937: 21; Emden, 1951: 353; Michelsen, 1980: 287. Synonymy after Emden, 1941*b*: 261.

Anthomyia inda Ackland & Pont, 1977: 439; Ackland, 1987: 43. **Syn. n.**

Holotype ♂ of *benguellae*: NAMIBIA: 'Holotype' [circular white label with red perimeter]; '*Anthomyia* / *benguellae* / Det. / J. R. Malloch, Type' [rectangular white written and printed label with black line border]; 'Benguella / (300 mls fr. coast.) / Dec. 1904 / Dr F. C. Wellman' [white rectangular handwritten label]; '*Anthomyia* ♂ / *quinquemaculata* Macq. / V. Michelsen det 1979' [rectangular white written and printed label]. In BMNH, reviewed by Michelsen (1980: 288), and during present study. Most of left wing missing; genitalia dissected and mounted in glycerol in a plastic tube on the staging pin.

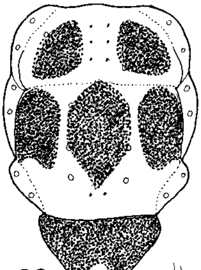
Paratype of *benguellae*: NAMIBIA: 1 ♀ , (SW Africa), Benguella, same data as holotype [labelled as allotype by Malloch]. In BMNH.

Holotype ♂ of *sensua*: SOUTH AFRICA: *KwaZulu-Natal*: 'New Hanover, Aug. 1914, C. B. H [ardenberg], H. K. Munro'; 'Type, *Anthomyia sensua* ♂ Curran' Det. C. H. Curran'. In Plant Protection Research Institute, Pretoria. Reviewed by Michelsen (1980: 288) who stated that the head and both hind legs were missing. Paratypes of *sensua*: 9

paratypes were listed by Curran, there are 2 in the BMNH: 1♂, South Africa, Gauteng, Pretoria, 10.i.1915, H. K. Munro; genitalia dissected and mounted in balsam, reviewed by Michelsen (1980: 288) and during present study; 1♀, New Hanover, 1.xii.1914, C. B. Hardenberg.

Holotype ♂ of *inda*: INDIA: NW India, Kasauli, F. Wyville-Thomson, in BMNH, reviewed Ackland, 1987.

Other material examined: ANGOLA: 1♀, 15 mls N Sade de Bandeira, *ca*. 6500 ft, 3.ii.1972, Southern African Exp., 1972 (BMNH). CENTRAL AFRICA: 1♂, no data, pres by E. Brunetti (BMNH). ERITREA: 1♂, Asmara, 20.x.1956, D. J. Greathead (BMNH); 3♂, same locality, 2350 m, 14.xi.1948, G. de Lotto (BMNH). KENYA: 10♂1♀, Nanyuki, 14.i.1959, em. 23.i, de Bruin (BMNH); 1♂, Muguga, iv.1969, C. F. Dewhurst (BMNH); 1♀, Trans-Naoia Dist., nr Cherangan Hills, 40 mls E of Mt. Elgon, 6200 ft, ix–x.1924, C. R. S. Pitman (BMNH). MALAWI: 1♀, Zomba, x.1910, Dr H. S. Stannus (BMNH); 2♀, Blantyre, 12.v.1910, Dr J. E. S. Old (BMNH). NAMIBIA: 1♀, Regenstein, 15 mls SSW Windhoek, 7.ii.1972, Southern African Exp., 1972 (BMNH); 1♂1♀, Otjikoko Süd Farm, 33 mls ENE Omaruru, 10–13.ii.1972, Southern African Exp., 1972 (BMNH); 2♀, Plateau Farm, 22 mls E Aus, 14–17.i.1972, Southern African Exp., 1972 (BMNH); 1♂, Windhoek, SE 2217 Ca, 28.xi–5.xii.1973, Malaise trap (NMWN); 1♂, same locality, 18.xii.1973 (NMWN); 1♂, Windhoek, 22°34'S:17°05'E, 29.xi.1986, J. Irish, Malaise trap (NMWN); 2♂1♀, Brandberg, pools on Wasserfallflache, 21°10'40"S:14°33'08"E, 2000 m, 21–23.x.1998, R. Butlin & J. Altringham, Malaise trap 8 (NMWN); 1♂, same locality, 21°10'42"S:14°32'55"E, yellow pan traps 8 (NMWN); 2♂8♀, Brandberg, Wasserfallflache at: 21°10'42"S:14°32'55"E, 2000 m, 19–21.x.1998, R. Butlin & J. Altringham, Malaise trap 5 (NMWN); 2♀, same locality, yellow pan traps 8 (NMWN); 1♂2♀, Brandberg, Plateau valley at: 21°10'46"S:14°32'52"E, 1950 m, 19–21.x.1998, R. Butlin & J. Altringham (NMWN); 1♂, same locality, yellow pan traps 9 (NMWN); 1♀, Brandberg, NE side Hungorob ravine at: 21°11'30"S:14°31'40"E, 1200 m, 26.x.1998, R. Butlin & J. Altringham, at light, 1900–0700 (NMWN); 1♂, Lüderitz, Obib waters, 28°00'S:16°38'E, 19–21.ix.1997, E. Marais & A. H. Kirk-Spriggs, Malaise trap sample (NMWN); 1♂, Lüderitz, Rooiberg, 28°38'S:16°28'E, 22–24.ix.1997, A. H. Kirk-Spriggs & E. Marais, Malaise trap samples (NMWN). SOUTH AFRICA: *Northern* Province: 1♂1♀, Tzaneen, xii.1952 (BMNH). *North West*: 2♀, Rustenburg, 6.ix.1965 (BMNH); 18♂9♀, Potchefstroom, 7.ii.1953, Paterson (BMNH); 1♂, Brits, 25.x.1953, Paterson (BMNH); 2♀, same locality, 10–11.iv.1955, Paterson, on faeces under fig (BMNH); 1♀, same data, 9.iii.1953 (BMNH). *Gauteng*: 1♀, Bapsfontein, x.1954 (BMNH); 2♀, Meyerton, 25.iii.1974, F. Zumpt (BMNH); 3♂1♀, Johannesburg, Parktown North, i–ii.1930, B. de Meillon (BMNH); 1♀, Johannesburg, 18.i.1952, Paterson, caught in house (BMNH); 1♂, same locality, 7.xii.1952 Paterson (BMNH); 1♀, same locality, 21.xii.1952 (BMNH); 1♂, same locality, 7.x.1949, F. Zumpt (BMNH); 1♂, Pretoria, i.1923, M. Forbes (NMSA); 1♂, same locality, 18.vii.1905; 1♀, same locality, xii. 1914, Breyer (NMSA). *KwaZulu-Natal:* 1♀, Zululand, Mgwavuma, iii.1917, E. W. Baxter (BMNH); 2♂1♀, Estcourt, ix–x.1896, G. A. K. Marshall (BMNH); 1 ♀, Pietermaritzburg, 18.i.1954, F. Zumpt (BMNH); 1♂, Weenen Nature Reserve, 28°51'S:29°59'E, 1–4.x.1990, Whittington, thornveldt, Malaise trap, dam (NMSA); 1♀, same locality and date, sweep net (NMSA); 1♂, nr Lilani, Ahrens dist., iv.1962, B. & P. Stuckenberg (NMSA); 2♀, #38, Royal Nat.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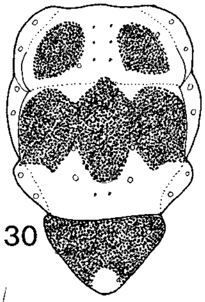
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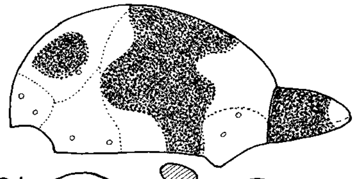
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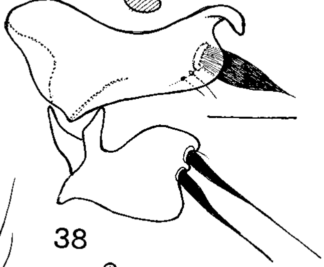
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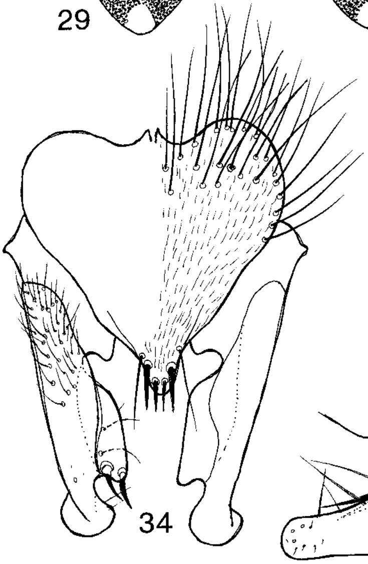
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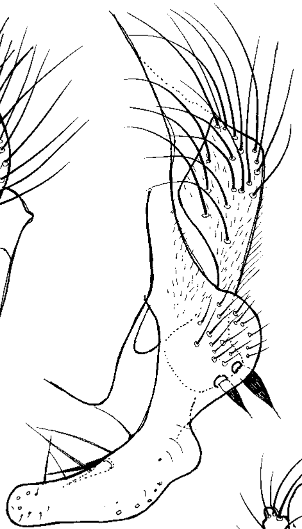
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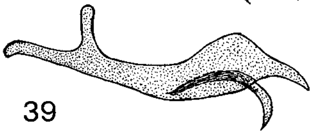
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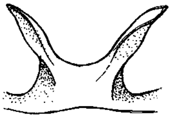
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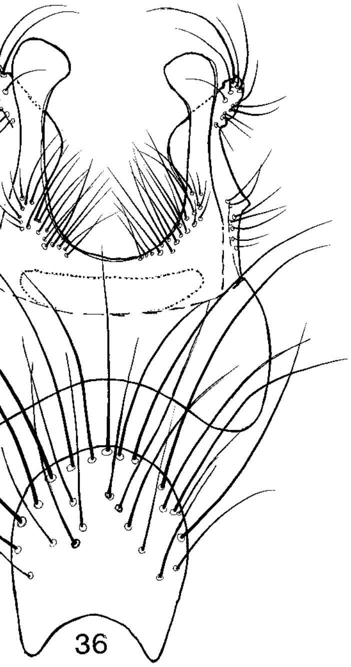
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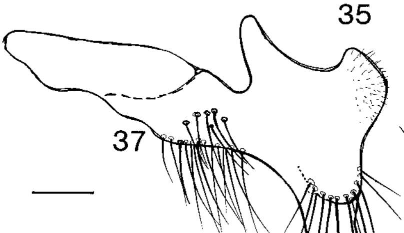
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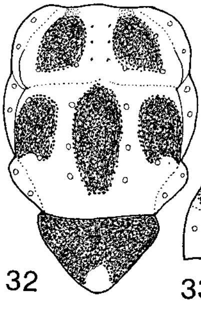
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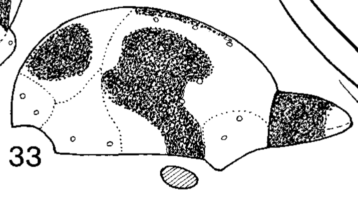
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Park, 28°41'S:28°56'E, 1440 m, 23–28.iii.1991, J. G. H. Londt, *Protea* woodland trap (NMSA); 2♀, Umtamvuna Nature Res., 31°00'06"S:30°10'38"E, 29.x.1990, Whittington, 450 m, forest margin (NMSA). *Eastern Cape*: 1♂6♀, Sheldon, viii, F. Zumpt (BMNH); 1♀, Willowmore, viii.1920, Dr Brauns (NMSA). *Western Cape*: 1♂, Cape Peninsula, Cape Town to Cape Point, 1–5.xi.1930, H. W. Simmonds (BMNH); 1♂, Table Mountain slopes, above cable house, Cape Town, 24.xi.1959, B. & P. Stuckenberg (NMSA); 1♂, Laaiplek, 3319DD, 9.x.1977, R. M. Miller (NMSA); 2♂1♀, nr Inverdoorn Ceres, Karroo at junction of Calvinia Sutherland Rd, 2–3.x.1959, B. & P. Stuckenberg (NMSA); 2♂3♀, Sevenweekspoort, Laingsburg dist., 19–22.ix.1959, B. & P. Stuckenberg (NMSA); 1♀, Stellenbosch, ix.1926, Dr Brauns (NMSA); 2♀, 7 km N Prince Alfred's Hamlet, 3319AD, 21.vi.1986, J. G. H. Londt, 850 m, Malaise trap, (NMSA); 2♂, Kloof Nek, Cape Town (5), 1–2.i.1972, (BM South African Expedition) (BMNH); 1♀, Cape Town, x.1937, A. E. Turner (BMNH). *Northern Cape*: 2♂, Prieska, x.1951 (BMNH). UGANDA: 1♂, Kigezi Dist., Mt. Muhavura, 29.xi.1934, 7000 ft, F. W. Edwards, B. M. E. Afr. Exp. (BMNH); 1♂3♀, Kigezi Province, Mabungo, xi.1934, 6000 ft, J. Ford, B. M. E. Afr. Exp. (BMNH). ZIMBABWE: 1♀, nr Fort Victoria, ix.1931, J. Ogilvie (BMNH); 1♀, Salisbury, [no date], J. Isgaer Roberts (BMNH).

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to blackish (with rather dense silvery dusting); parafrontals opposite lunule with a dark shifting sheen stripe which extends from lunule to level of arista, and a blackish non-shifting spot in vibrissal angle which does not extend above genal groove when viewed in profile; face and occiput blackish (with normal dusting), except upper part of occiput rather shining blackish. Antennae entirely dark brown to blackish. Palpi dark brown to black; arista brownish at base; prementum dark brown, thinly dusted. Thorax (Figs 29–31) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface; transverse postsutural band across the scutum either complete between wing bases (but anterior and posterior margins strongly indented along dorsoventral rows), or in some examples (Fig. 29) the band is narrowly separated by grey dusted strips; presutural spots separated behind head, each spot filling the space between presutural dorsocentrals and posthumeral setae (inner margins extending halfway towards the presutural acrostichal setulae; scutellum largely black, with only its tip silvery grey. Pleura largely grey dusted, only lower part of the post pronotal lobe and anterior corner of anepisternum brownish black. Abdomen largely densely dusted over dark ground-colour, with contrasting black and grey pattern on tergites (black central vitta on 3rd and 4th tergite as wide as depth of femur (wider anteriorly) and lateral marks more or less connected along anterior margins of tergites); pregenital sclerite contrastingly shining brownish black (undusted); hypopygium and 5th sternite rather finely dusted. Wing membrane slightly brownish orange tinged basally; wing bases with orange-brown veins; squamae paler than wing base with whitish fringes; halteres yellow. Legs entirely dark

Figs 29–40. *Anthomyia benguellae* Malloch. 29–31. ♂ thorax (Cape Town, Western Cape). 29. Dorsal view. 30. Dorsal view. 31. Lateral view. 32–33. ♀ thorax (Johannesburg, Gauteng). 32. Dorsal view. 33. Lateral view. 34–40. ♂ terminalia (Western Cape). 34. Cercal plate and surstyli, caudal view. 35. Ditto, lateral view. 36. 4th and 5th sternites, ventral view. 37. 5th sternite, lateral view. 38. Gonites. 39. Distal section of aedeagus. 40. Central process of synsternite (6+7).

brown to blackish (except for the partly shining trochanters which are sometimes orange-brown).

Head: Parafrontalia very narrow posteriorly (either separated by linear frontal stripe or touching), widening anteriorly to slightly less than width of first flagellomere; eyes separated by less than half to slightly more than width of anterior ocellus; genae below lowest point of eye margin 0.26–0.28 times eye-height. 3–4 pairs of parafrontal setae on anterior half of distance between antennal base and anterior ocellus; short interfrontal setulae present. First flagellomere slightly more than twice as long as wide (apex not quite reaching lower facial margin); arista tapering from base to apex (not abruptly narrowing in distal two-thirds), about 1.5 times length of first flagellomere, short pubescent, longest hairs about as long as diameter of base. Prementum about 0.4 times as long as head height.

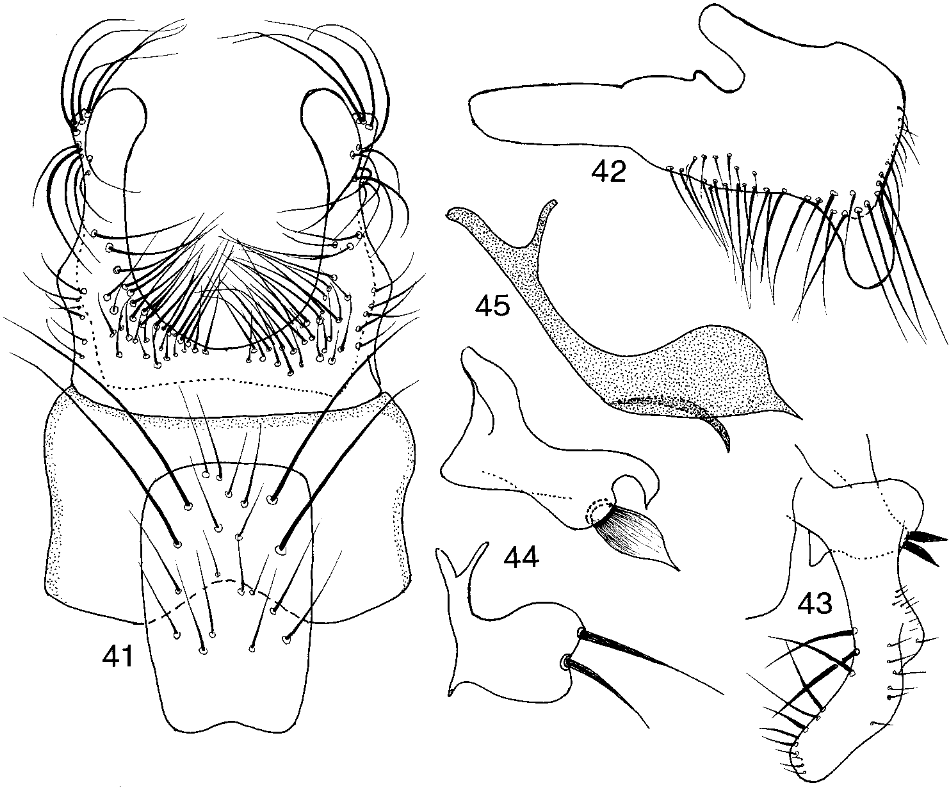
Thorax: 3 pairs of presutural acrostichals (the middle the longest) in rows separated by about distance from each to adjacent dorsocentral row, with or without additional setulae in between; acr / dc ratio 1:1:1; 1 + 1 posthumerals; prealar of same length or slightly shorter than posterior notopleural; dorsal surface of scutellum bare centrally, setulose towards sides; katepisternals 1 + 2, lower posterior nearly as long as upper anterior seta, anterior seta three-quarters length of upper posterior seta; anepisternum with a fine setulose hair on upper anterior corner.

Legs: f2 with row of 5–6 pv on about basal half, 9 shorter av; f3 with 9 av in distal half; t1 with median 1 pv; t2 with 1 very short ad, 1–2 pd and 2p/pv; t3 with 1 av, 8–10 ad, 2 pd and 4–6 pv.

Wing: costa with all marginal spinules short; the pair before distal break not differentiated; lower crossvein sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.3 times length of preceding section. Lower squama as long as upper.

Wing length up to 5.5 mm.

Abdomen: Long ovate, about 1.6–1.7 times as long as wide at 3rd tergite, tapering slightly from 3rd to 5th tergite. 3rd and 4th sternites long and narrow, at least thrice as long as wide (lateral setae of 3rd sternite rather long posteriorly); 4th sternite (Fig. 36) about as long as wide, with a rounded posterior margin, densely clothed with long setae posteriorly. 5th sternite processes (Fig. 36) with a few short setae laterally at their bases, otherwise with long bi-triserial rows of setulae on their concave inner margins; membranous lobes (Fig. 37) strongly projecting ventrally in lateral view, apically rather truncate, the apical setulae long and separated from the basal setulae (distinct gap in lateral view). Central process of synsternite (6+7) (Fig. 40) with divergent arms. Surstylus (Fig. 35) strongly downcurved, appearing constricted medially in lateral view, with 2 short spinules below the angle of its inner lobe; in profile upper dorsal margin with a well developed lobe. Cercal plate (Fig. 34) of about equal length and width, with a few short apical spinules and 1–2 pairs of longer setulae on either side of them, otherwise setulose only on basal half, in profile apex not projecting, concealed behind surstylus. Pregonite (Fig. 38) with 2 expanded setulae on dorsal half of distal margin, constricted basally; postgonite (Fig. 38) with an expanded setula (with outer lobe projecting above its base); distal section of aedeagus (Fig. 39) with a reclinate dorsal process separated from its base by its length, dorsal margin of distal section concave in lateral view, with the forked tips of its dorsal sclerotisation projecting beyond the downcurved acrophallic sclerite.



Figs 41–45. *Anthomyia* sp. (?*benguellae*). (Namibia, bred from rock hyrax dung). 41–45. ♂ terminalia. 41. 4th and 5th sternites, ventral view. 42. 5th sternite, lateral view. 43. Surstylus, lateral view. 44. Gonites. 45. Distal section of aedeagus.

Female:

Colour: Head dark as in male. Thoracic pattern (Figs 32, 33) very similar to that of male, scutal spots generally separated along dorsocentral rows, scutellum with apical grey spot often larger than the male, and sometimes base of scutellum narrowly grey dusted. Abdomen with black and grey pattern on abdominal tergites similar to that of male (or in some specimens with central and lateral black marks separate, not connected along anterior margins of tergites). Legs dark as in male.

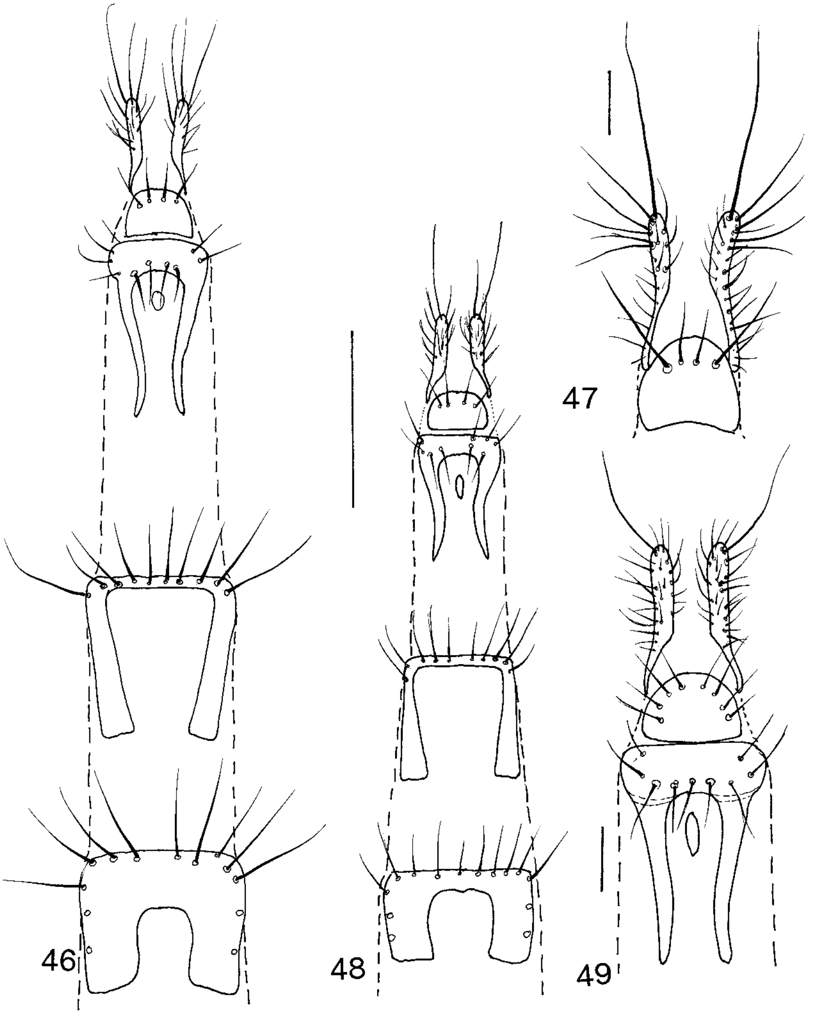
Head: Eyes widely separated (by about their transverse width, ratio 30:27:30); interfrontalia at level of middle ors about thrice as wide as each parafrontal; parafrontalia widening anteriorly to about width of first flagellomere; genae below lowest point of eye margin about 0.36 times eye height. Arista tapering as in male. Parafrontal setae differentiated into 3 pairs of orbital setae (anterior setae normally proclinate, posterior two reclinate) + 2 pairs of (inwardly directed) frontal setae; crossed interfrontal setae well developed, their tips reaching margins of frontal stripe.

Thorax: Presutural acrostichal setulae finer and shorter than in male. Katepisternals 1 + 1.

Legs: f2 with 1–2 av and 2–3 pv on basal half; f3 with 6 av , and 2 preapical pv; t1 with 1 p; t2 with 1 ad, 2 pd and 2 p/pv; t3 with 1 av, 5 ad and 2 pd.

Wing length up to 5.0 mm.

Abdomen: Postabdomen (Figs 46, 47) equal in length to preabdomen. Tergites 6–8 more or less continuously sclerotised across the dorsum posteriorly (where they bear rows of setulae), divided anteriorly into pairs of dorsolateral strips (those on 8th tergite long and narrow, and closer together anteriorly, with a trace of a central strip). 6th and 7th spiracles not enlarged, both posteriorly situated on 6th segment (6th on border between tergite and membrane, 7th within posteroventral corners of 6th tergite). 6th and 7th sternites long and narrow, each bearing a few setulae posteriorly (one pair rather long); 8th sternite divided into pair of elongate strips



Figs 46–49. Characters of ♀ ovipositors. 46–47. *Anthomyia benguellae* Malloch. 46. ovipositor, dorsal view (North West, South Africa). 47. Ditto, apical segments, dorsal view (Western Cape, South Africa). 48–49. *Anthomyia parapluvialis* sp. n. 48. ovipositor, dorsal view (Namibia), 49. Ditto, apical segments. Figs 46, 48, scale = 0.5 mm.

of sclerotisation (not quite as long as 8th tergite), each bearing 4–5 setulae posteriorly. 10th tergite almost as long as wide, bearing about 4 setulae posteriorly; 10th sternite longer than wide, covered with numerous short setulae (4 longer on posterior margin); cerci long and slender (especially basally) about 1.7 times length of 10th tergite, with 2 longer setulae apically. 3 spermathecae, ribbed, longer than wide (0.13 x 0.07 mm).

Discussion: Michelsen (1980) revised the status of *Anthomyia quinquemaculata* Macquart, 1839 (Type locality Canary Islands) to a distinct species (previously considered a synonym of *pluvialis* L.). At the same time he synonymised *benguellae* Malloch and *sensua* Curran as synonyms of *quinquemaculata* (*sensua* was previously established as a synonym of *benguellae* by Emden 1941*b*). *A. quinquemaculata* was therefore at that time considered as a widely distributed species ranging from southern Europe to Ethiopia, Kenya, Uganda and South Africa.

In 1997 Michelsen decided that there were small differences in the male genitalia to warrant making *benguellae* a valid species. In *quinquemaculata* the ventroapical corner of the postgonite is not expanded (or only very slightly) over the insertion of the widened setula, which arises on the inside surface; in *benguellae* the ventroapical setula is covered by a larger projecting lobe. For other small differences between *benguellae* and *quinquemaculata* see Ackland (1987: 45).

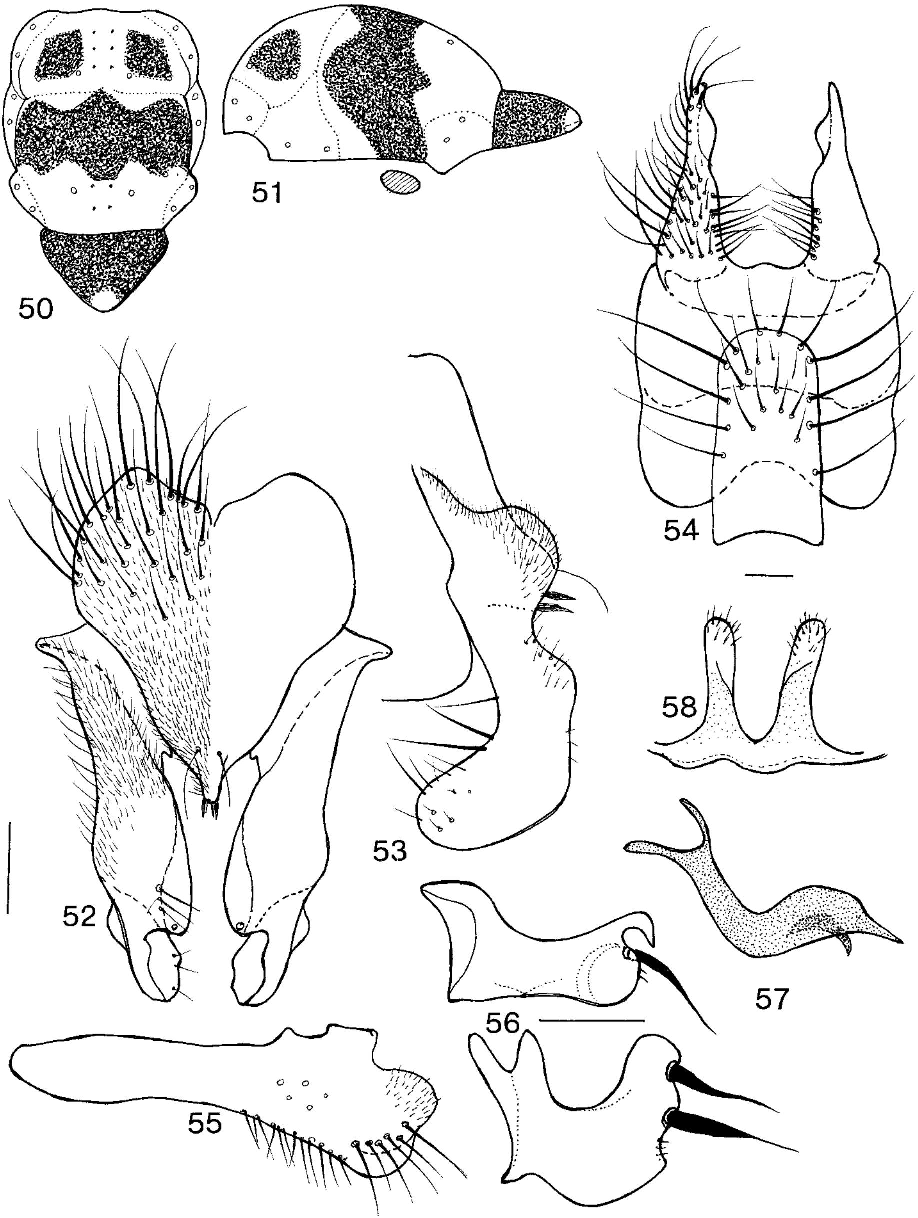
The male genitalia of *benguellae* are in fact the same as those of *inda*. In spite of the rather different appearance of the scutal black pattern (five smaller discrete spots postsuturally in *inda* from northern India; three discrete or narrowly joined spots in *benguellae* from southern Africa), material I have seen from intermediate localities suggests that *benguellae* is a widely distributed species ranging from the Indian subcontinent to South Africa.

Cuthbertson (1937) reported this species (as *sensua* and *benguellae*) from Zimbabwe, where both sexes were seen on flower heads of grasses; females were observed ovipositing in damp rich soil at the roots of grasses.

The following material from Namibia (Figs 41–45) differs from *benguellae* in having the 4th sternite less setose (Fig. 41) apical margin of the membranous lobe of the male 5th sternite rounded (Fig. 42), and the basal setulae on the inner margins of the processes are continuous to apex of the processes (a distinct gap in typical *benguellae*). One male and two females in this material were bred from rock hyrax dung, the other two males, from Brandberg were caught in a Malaise trap. All the males agree with the differences noted above, the females which are presumably associated with the male, show no differences from typical female *benguellae*. More material may indicate that these differences are constant.

Additional material of ?*benguellae*: NAMIBIA: 1♂2♀, Karibib, Gross Spitzkoppe, 22°49'S:15°43'E, 12.vii.1997, A. H. Kirk-Spriggs, reared from moistened rock hyrax dung, em. 4.ix.1997 (♂), and 8.ix.1990 (♀) (NMWN); 2♂, Brandberg, Wasserfallflache at: 21°10'42"S:14°32'50"E, 2000 m, 19–21.x.1998, R. Butlin & J. Altringham, Malaise trap 5 (NMWN).

Distribution: Northern India west to Oman, Eritrea, Kenya, south to Zimbabwe, South Africa and Namibia. (The range of *quinquemaculata* is from the Canary Islands, North Africa, Spain, southern Europe to Greece.)



Figs 50–58. *Anthomyia tempestatum* Wiedemann. 50–51. ♂ thorax (Namibia). 50. Dorsal view. 51. Lateral view. 52–58. ♂ terminalia (Eastern Cape, South Africa). 52. Cercal plate and surstyli, caudal view (apical spinules omitted). 53. Ditto, lateral view. 54. 4th and 5th sternites, ventral view. 55. 5th sternite, lateral view. 56. Gonites. 57. Distal section of aedeagus. 58. Central process of synsternite (6+7).

Anthomyia tempestatum Wiedemann, 1818

(Figs 50–65)

Anthomyia tempestatum Wiedemann, 1818: 46; Stein, 1906: 75; Stein, 1908: 171; Bezzi, 1908: 97, 119; Speiser, 1910: 159; Stein, 1913: 561; Stein, 1918: 199; Stein, 1919: 147; Hennig, 1968: 213; ? Malloch, 1924: 268, 272; Speiser, 1924: 103; Karl, 1935: 47; Zimsen, 1954: 25; Ackland, 1977: 207; Büttiker, Attiah & Pont, 1979: 358; Michelsen, 1997: 39.
Anthomyia tempestatum Thomson, 1869: 556; Stein, 1910*a*: 72.
Anthomyia pluvialis tempestatum Wiedemann: Emden, 1948: 163 (in part).

Lectotype ♂: SOUTH AFRICA: *Cape*: 'Cap. b. sp' [=Caput bonae spei; printed label]; 'tempestatum / Coll. Wiedem.' [printed label]. In good condition. Genitalia dissected by Michelsen and stored in glycerol in a plastic tube on the pin. Lectotype designated by Michelsen 1997: 40. In NMW.

Material examined: KENYA: 1♂, Muguga. ix.1969, C. F. Dewhurst (BMNH). NAMIBIA: 1♂, Rietfontein, 23 mls SW Grootfontein (W49), 3.iv.1972, Southern African Exp., 1972 (BMNH). OMAN: 1♂, Jabal Shams, 23°12'N:57°12'E, 1910 m, to light, 20–21.x.1994, M. D. Gallagher, 8627 (NMWC). SAUDI ARABIA: 1♂, no locality or date, W. Büttiker (BMNH). SOUTH AFRICA: *Eastern Cape*: 1♂, Lundeans Nek, Barkly East dist., 18.i.1963, B. & P. Stuckenberg, 1925–2100 m (NMSA). YEMEN: 1♂2♀, San'a, *ca*. 7900 ft, 2–15.x.1937, Dr Carl Rathjens, from lucerne (BMNH).

Male: As *A. benguellae*, except:

Colour: Transverse postsutural band across the scutum (Figs 50–51) always complete between wing bases (in the material listed above), but anterior and posterior margins strongly indented along dorsoventral rows, presutural spots separated behind head, each spot about as long as wide. Wing membrane fairly clear; wing bases with pale brownish veins; squamae paler.

Head: Parafrontalia touching in upper frons half, widening anteriorly to slightly less than width of first flagellomere; eyes separated by diameter of anterior ocellus; genae below lowest point of eye margin 0.3 times eye-height. 2–3 pairs of parafrontal setae on anterior half of distance between antennal base and anterior ocellus; arista widened in basal quarter to two-thirds, then abruptly narrowing, about 1.5 times length of first flagellomere, short pubescent, longest hairs about as long as diameter of base. Prementum about 0.35 times as long as head height.

Thorax: 2–3 pairs of rather fine presutural acrostichals (about same length) in rows slightly closer together than to dorsocentral rows, without additional setulae in between; acr / dc ratio 5:4:5; prealar slightly shorter than posterior notopleural; katepisternals 1 + 2, anterior seta very short and hair-like, much shorter than dorsal posterior seta.

Legs: f2 with 5 short pv on about basal half, no av; f3 with 9–12 av on whole length, becoming longer distally, pv on whole length; t1 with 1 fine median pv; t2 with 1 very short ad, 1–2 pd and 2 p/pv; t3 with 7 av (distal one longer), 8–10 ad of varying length, 3–4 pd and 7–8 short pv. Pulvilli three-quarters length of 5th tarsal segment.

Wing: last section of M_{1+2} 1.25 times length of preceding section.

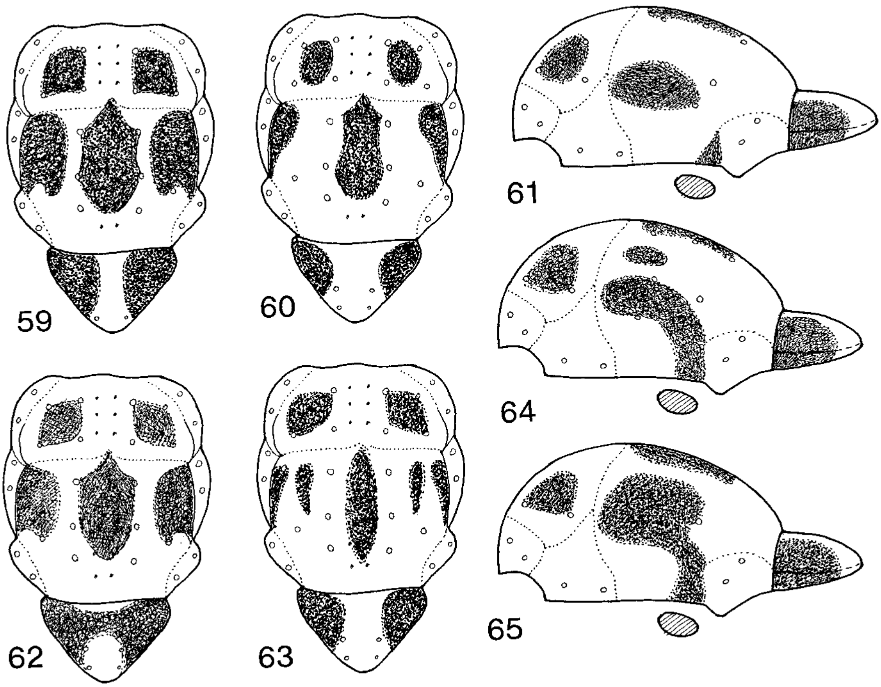
Wing length up to 5 mm.

Abdomen: 4th sternite (Fig. 54) twice as long as wide, parallel-sided with about 4 longer lateral setae on each side, and a few shorter setae posteriorly. 5th sternite processes (Fig. 54) with some longer lateral setae basally, otherwise with some longer inwardly directed setae on inner margins (mainly uniserial); membranous lobes (Fig. 55) very small, hardly projecting in lateral view. Central process of synsternite (6+7) (Fig. 58) with arms more or less parallel, minutely pilose apically. Surstylus (Fig. 53) robust in lateral view, with the basal dorsal lobe large. Cercal plate (Fig. 52) longer than wide, with a narrowly produced apex, in profile the apex is concealed behind surstylus. Pregonite (Fig. 56) with posterior margin strongly expanded, twice as wide as the constricted median part, bearing 2 short strongly expanded setulae; postgonite (Fig. 56) with a slightly expanded setula situated close to the hook-like posterodorsal corner. Distal section of aedeagus (Fig. 57) with a strongly reclinate curved dorsal process separated from its base by its length, dorsal margin of distal section concave, forming a right angle in lateral view (strongly flexed).

Female: (perhaps not separable from *A. parapluvialis*, the following characters taken from a female collected together with a male at Lundeans Nek, E Cape). Similar to the female of *A. benguellae* except for the following:

Colour: Thoracic pattern very similar to that of male.

Head: Eyes widely separated (by about slightly more than their transverse width, ratio 9:12:9); genae below lowest point of eye margin about 0.38 times eye height. Arista abruptly tapering as in male at about apical third.



Figs 59–65. Patterns of thorax markings (Morocco). 59–61. *Anthomyia pluvialis* L. 59. ♂ thorax, dorsal view. 60. ♀ thorax, dorsal view. 61. ♀ thorax, lateral view. 62–65. *Anthomyia tempestatum* Wiedemann. 62. ♂ thorax, dorsal view. 63. ♀ thorax, dorsal view. 64. ♀ thorax, lateral view. 65. ♂ thorax, lateral view.

Thorax: Presutural acrostichal setulae short and the rows closer together than to dorsoventral rows, acr/dc ratio 3:2:3. katepisternals 1 + 1, anterior seta fine and half length of posterior seta.

Legs: f2 and f3 with very short ventral setulae; t2 with 1 short ad, 2 pd and 2 p/pv; t3 with 1 av, 3–4 ad, 1 pd and 3–4 short p setae.

Wing length up to 5.0 mm.

Discussion: Michelsen (1997) examined 10 syntypes of *tempestatum* Wiedemann. He designated as lectotype a male (which had been examined by Stein in 1913) which belonged to *Anthomyia tempestatum* as understood by Hennig (1968) and Ackland (1977). He identified the remaining paralectotypes as *A. benguellae* Malloch.

Hennig's concept of *tempestatum*, and illustrations of the genitalia were based on material I sent to him, which was collected in Morocco by Dr A. C. Pont. The genitalia figures (especially text-fig. 193) agree exactly with Figs 52–58 in this paper of a specimen from eastern Cape. Hennig did not examine any types of *tempestatum*, but stated that they were in the ZMUC; however Michelsen (1997) did not regard these as syntypes. Stein, Malloch and Emden all recorded *tempestatum* from the Afrotropical Region, but at least some of these records refer to an undescribed species (*parapluvialis* of this paper). It is not possible to say which records refer to *tempestatum*.

It is possible to separate both males and females of *tempestatum* and *pluvialis* in Moroccan material (Figs 59–65) (*parapluvialis* does not occur there) by the nature and extent of the scutal black pattern (and in the males by the shape of the 5th sternite). The scutellum in ♂ *pluvialis* (Fig. 59) has the lateral black spots divided medially, in *tempestatum* (Fig. 60) they are joined basally; the thorax in ♀ *pluvialis* (Fig. 60) has three postsutural spots, whilst in *tempestatum* (Fig. 63) there are five postsutural spots.

But because the black postsutural band in *tempestatum* from central and South Africa is more or less continuous (spots fused together), and in many examples of *parapluvialis* the band may be fused, or sometimes divided by grey dusting, males can only be identified with certainty by reference to the lateral view of the 5th sternite (and of course dissection of the postabdomen). In view of the large number of widespread records of *parapluvialis* (based on males) and the fact that I have only been able to find three males of *tempestatum* from the Afrotropical Region, I suspect that most of the records of *tempestatum* probably refer to *parapluvialis*.

Stein was doubtful about the validity of *tempestatum* as a distinct species from *pluvialis*. He recorded *tempestatum* from Namibia and Tanzania (1906), South Africa (1908), Zimbabwe, Ethiopia, South Africa (1913). In view of numerous records and wide distribution of *parapluvialis*, and the very few specimens I have seen of *tempestatum* from the Afrotropical Region, most of Stein's records of *tempestatum* must remain doubtful.

A. tempestatum males can be distinguished from *benguellae* and *parapluvialis* by the chaetotaxy of the hind tibia which has about 7 av, 8–12 ad of varying length, 3–4 pd and 7–8 short pv setae; cercal plate with a narrow pointed apex, surstyli in lateral view wider, pregonite very strongly expanded distally, distal section of the aedeagus bent at right angles, postgonite with only a slightly expanded setula, 5th sternite processes with a small subapical membranous lobe. I have not been able to find any characters to separate the females reliably in the Afrotropical Region (note previous comment on Moroccan *tempestatum*).

Distribution: Namibia, South Africa to Kenya, Yemen, Saudi Arabia and Oman (Palaearctic: North Africa, Spain, Mediterranean region).

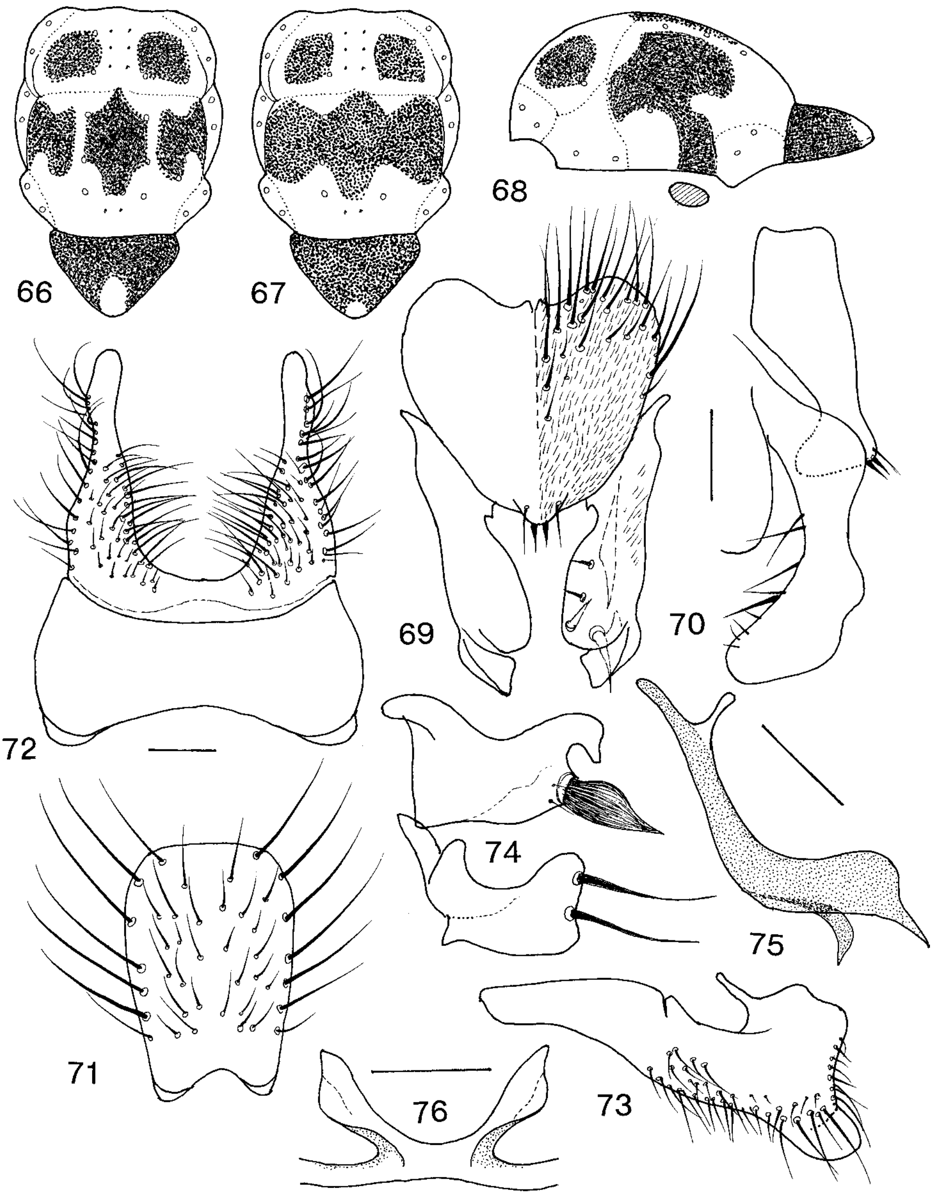
Anthomyia parapluvialis sp. n.

(Figs 48, 49, 66–76)

'*Anthomyia tempestatum* Wiedemann'. Malloch, 1924: 272 (? in part).
'*Anthomyia pluvialis tempestatum* Wiedemann'. Emden, 1941*a*: 213; Emden, 1941*b*: 262; Emden, 1956: 530.

Holotype ♂: SOUTH AFRICA: *Western Cape*: 'Holotype' [circular white label with red perimeter]; 'Brandkop area / Calvinia district / South-west Cape / 14 October 1964 / B. & P. Stuckenberg' [rectangular white printed label]; 'Holotype ♂ / *Anthomyia* / *parapluvialis* / D. M. Ackland; [rectangular red printed and written label]. In good condition, left hind leg missing. In NMSA.

Paratypes: ANGOLA: 1♀, 12 mls SW Luimbale, *ca*. 5500 ft, 20–21.iii.1972, Southern African Exp., 1972 (BMNH). BOTSWANA: 13♂1♀, Kuke Pan, (E87), 0°59'S:22°25'E, 14–15.iv.1972, Southern African Exp., 1972 (BMNH); 1♂, Mababe Flats, 7.x.1958 (BMNH); 1♀, Kenye, i.1956, F. Zumpt (BMNH); 9♂1♀, Serowe, bush savanna, 1996, cantharidin trap, Per Forchhammer (DMA). ETHIOPIA: 1♂, Prov. Gojjam, Mt. Choke, 20.xii.1972, G. B. White, ex faeces of gelada baboon (BMNH): 2♂1♀, Addis Ababa, Entotto, 17.x.1968, R. Kano & T. Ohse, 3000 m (DMA). KENYA: 2♂, Muguga, ix.1969, C. F. Dewhurst (BMNH); 1♂, same data but 15–17.vi.1969 (BMNH); 1♀, Nairobi, 9–13.xii.1970, A. E. Stubbs, 5500 ft (BMNH): 1♂, Muguga, 6–12.i.1969, M. Birch (DMA). LESOTHO: 1♀, Maseru district, Blue Mountain Pass, Makhaleng Valley, Maloti Mountains, 12–14.i.1963, 2150–2525 m, B. & P. Stuckenberg (NMSA). NAMIBIA: 2♂5♀, Otjikoko Süd Fm., 33 mls ENE Omaruru (W36), 10–13.ii.1972, Southern African Exp., 1972 (BMNH); 1♂1♀, Regenstein, 15 mls SSW Windhoek (W54), 9.iv.1972, Southern African Exp., (BMNH); 1♀, Kombat, 1–6.iv.1972, Southern African Exp., 1972 (BMNH); 6♂2♀, Lüderitz, Skorpion Hill, 27°49'S:16°36'E, 9–12.viii.1997, E. Marais & A. H. Kirk-Spriggs, Malaise trap (NMWN); 2♂1♀, Lüderitz, Obib waters, 28°00'S:16°38'E, 19–21.ix.1997, A. H. Kirk-Spriggs & E. Marais, Malaise traps (NMWN); 1♂, same data but 25–26.viii.1998 (all NMWN type series T636). SOUTH AFRICA: *Northern Province*: 2♂, Naboomspruit, 24.ii.1960 (BMNH); 1♀, Potgietersrust, 6.xii.1953 (BMNH). *North West*: 3♂, Potchefstroom, 18.xii.1952, Paterson (BMNH); 1♂, same data but 23.xi.1952; 1♂1♀, same data but 7.ii.1953 (BMNH). *KwaZulu-Natal*: 2♂, Weenen Nature Reserve, Umthombe, 28°51'S:29°59'E, 1–4.x.1990, A. E. Whittington, thornveld, sweepnet (NMSA). *Gauteng*: 1♂, Vereeniging, 23.i.1954 (BMNH); 1♂, Johannesburg, 29.iii.1952, Paterson (BMNH); 1♂, same data but 7.x.1951 (BMNH); 1♂, same data but 4.xi.1951, F. Zumpt (BMNH); 1♂, same data but 30.xi.1952, Paterson (BMNH); 1♂, Bapsfontein, x.1954 (BMNH); 2♀, Pretoria, 23.xi.1952 (BMNH). *Eastern Cape*: 1♂, 16 mls E of Cradock Farm 'Who can tell', 3225Bb, M. E. & B. J. Irwin (NMSA); 1♂, Lundeans Nek, Barkly East dist., 18.i.1963, B. & P. Stuckenberg, 1925–2100 m (NMSA); 1♂, Willowmore, 29.xii.1935, Dr Brauns (NMSA); 1♀, same data but v.1919 (NMSA). *Western Cape*: 1♂1♀, Nr Inverdoorn Ceres, Karroo at junction of Calvinia Sutherland Rd, 2–3.x.1959, B. & P. Stuckenberg (NMSA); 3♂5♀, Brandkop area, Calvinia district, 14.x.1964, B. & P. Stuckenberg (NMSA). *Northern Cape*: 3♂1♀, Colesburg, 2–4.xii.1953 (BMNH); 2♀, Hester Malan



Figs 66–76. *Anthomyia parapluvialis* sp. n. ♂ paratypes. 66. Thorax, dorsal view (Western Cape, South Africa). 67. Ditto (Botswana). 68. Ditto lateral view (Western Cape). 69–76. ♂ terminalia. 69. Cercal plate and surstyli, caudal view. 70. Ditto, lateral view. 71. 4th sternite, ventral view. 72. 5th sternite, ventral view. 73. Ditto, lateral view. 74. Gonites. 75. Distal section of aedeagus. 76. Central process of synsternite (6+7).

Nat. Res., 10 mls E Springbok, 7–8.i.1972, Southern African Exp., 1972 (BMNH); 1♂, 10 km SW Sutherland, 32°20´S:20°36´E, 28.xi.1990, Whittington & Londt, S slope Swaarweerberg (NMSA). ZIMBABWE: 1♂, Salisbury, xi.1951, F. Zumpt (BMNH); 1♀, Salisbury, 3.iv.1927, A. Cuthbertson, grass in marsh, (BMNH).

Other material examined: KENYA: 1♂, Nanyuki (S), v.1948, van Someren (det. *A. pluvialis tempestatum* by Emden, 1948); 1♂, Trans-Naoia Dist., nr Cherangani Hills, 40 mls E of Mt. Elgon, 6200 ft, 6–9.ii.1925, C. R. S. Pitman (det. *A. pluvialis tempestatum* by S. V. Peris, 1947) (BMNH). SOUTH AFRICA: *KwaZulu-Natal*: 4♂, Estcourt, ix.–x.1896, G. A. K. Marshall (1♂, det *A. tempestatum* by Malloch). *Northern Cape*: 1♂5♀, Calvinia, xi.1931, J. Ogilvie (det. *A. pluvialis tempestatum* by Emden, 1940) (BMNH); 1♂, Nieuwoudtville, 18–22.xi.1931, Mrs L. Olgivie (BMNH).

Etymology: From the Gr. para- meaning ‘by the side of’ and indicating a close relationship with *pluvialis*.

Anthomyia parapluvialis is closely related to both *tempestatum* and the holarctic *pluvialis*, and differs from both mainly in the male genitalia.

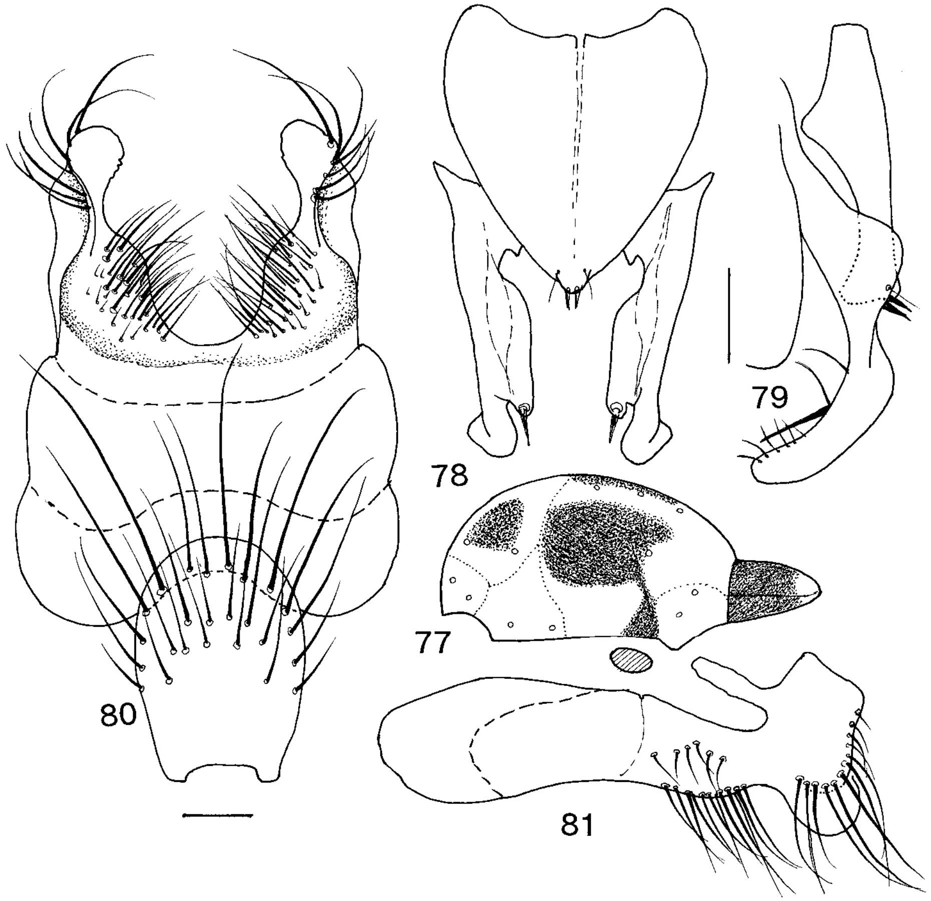
Male:

Thorax: Transverse postsutural band separated into three spots (Fig. 66, Western Cape) or narrowly joined (Fig. 67, Botswana, Kenya, North West (South Africa)). But this character is variable even in material from the same locality. Presutural acrostichal setae rather closer together in most specimens (ratio 5:3:5). Anterior katepisternal seta longer than in *tempestatum* (about three-quarters length of posterior dorsal seta).

Legs: t3 with 1 av, 5 ad, 2 pd and only 3–4 short p setae (more numerous in *tempestatum*).

Abdomen: Long ovate, tapering from 3rd to 5th tergite; only about one and two thirds as long as wide (at 3rd tergite), in profile rather robust, semi-compressed in basal two-thirds. a wide central vitta on all tergites, except only basally on 5th tergite, which is as wide as depth of hind femur, or even wider anteriorly where it joins a narrow black band which expands into a lateral triangular spot half length of tergites. 4th sternite (Fig. 71) similar to *tempestatum* (and differing from *pluvialis*); 5th sternite (Fig. 72) with the membranous lobe on processes apically placed, projecting caudally (Fig. 73), with the apical lateral setae not much longer than the lobes, in profile there is no gap between the inner basal setae and the apical lateral setae (present in *pluvialis*), and the ventral margin is straighter than in *pluvialis*. Inner margin of processes in ventral view (Fig. 72) concave, only becoming weakly convex in middle. Postabdomen: Cercal plate (Fig. 69) not produced apically; surstylus (Figs 69–70) less robust than *tempestatum* but not as slender in apical half as *pluvialis*. Central process of synsternite (6+7) (Fig. 76) similar to *pluvialis*, arms widely divergent. Pregonite (Fig. 74) less expanded apically than *tempestatum*; postgonite (Fig. 74) with an expanded setula (as *pluvialis*); distal section of aedeagus (Fig. 75) in lateral view strongly flexed, but angle of concavity on dorsal margin more than 90°.

Discussion: Both Malloch (1924: 272) and Emden (1951: 354) misidentified this species. In 1924 Malloch listed several localities for *tempestatum* Wied., one being Estcourt,



Figs 77–81. *Anthomyia pluvialis* L. (Malta). 77. Thorax, lateral view. 78–81. ♂ terminalia. 78. Cercal plate and surstyli, caudal view. 79. Ditto, lateral view. 80. 4th and 5th sternites, ventral view. 81. 5th sternite, lateral view.

Natal. There is a male of *parapluvialis* from Estcourt in the BMNH carrying a det label '*A. tempestatum* det. Malloch'. There are also several males of *parapluvialis* determined by Emden as *A. pluvialis tempestatum*; I suspect that the specimen mentioned by Emden (1951: 354) from Natal, and identified by Malloch as *procellaris*, and re-identified by Emden as an aberrant *benguellae*, is in fact also *parapluvialis*. Emden's remark that 'the apical production of the fourth ventrite [=5th sternite] is more directed forward [*sic*] than ventrad, and the postsutural band is as in the latter species' could apply to *parapluvialis*. The terminalia of *Anthomyia pluvialis* from Malta are illustrated (for comparison) in Figs 77–81.

The only record of larval habitat is the ♂ bred from gelada baboon dung in Ethiopia by Dr G. B. White (see under *Anthomyia whitei*).

Distribution: *Anthomyia parapluvialis* appears to be widely distributed in the Afrotropical Region, with records from Angola, Botswana, Namibia, South Africa to Kenya and Ethiopia.

Anthomyia ornata superspecies

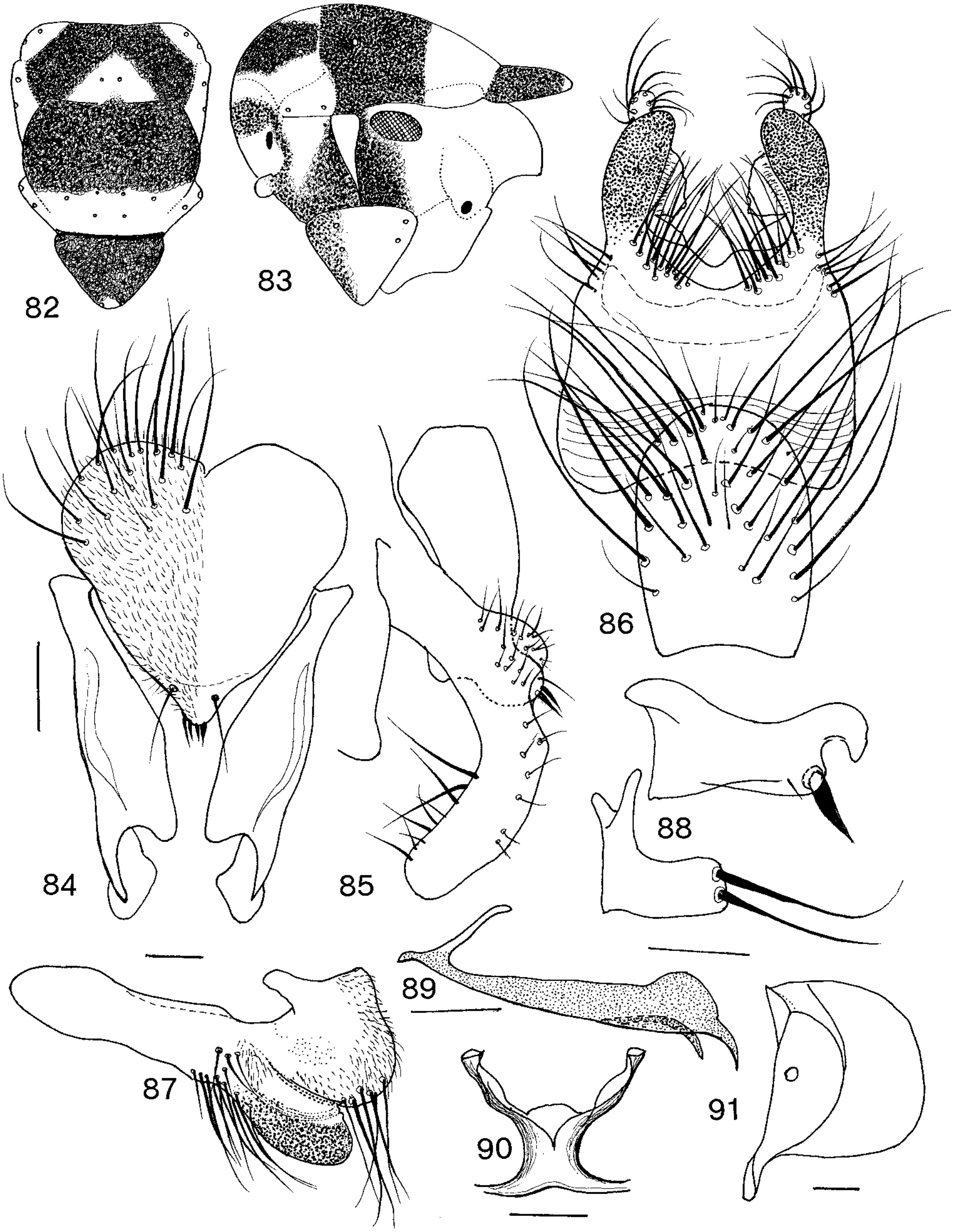
I propose this superspecies for four afrotropical species in which the postgonite has the setula on the ventral margin situated on the inner surface of the postgonite, the processes of the 5th sternite have long setae on the inner basal margins (tips of setae touching or crossing on midline). The membranous lobes of the 5th sternite processes are large and ventrally projecting; 4th sternite with dense long lateral and posterior setae; central median process of the synsternite (6+7) large and bilobed. I include the following afrotropical species: *maculigena* Stein, *ornata* (Bigot), *whitei* sp. n. and *stuckenbergi* sp. n. *Anthomyia imbrida* Rondani, and *bazini* Séguy (Palaearctic) belong to this superspecies. The following palaearctic and holarctic species may also belong to this superspecies: *oculifera* Bigot, *plurinotata* Brullé, *malaisei* Ackland, *vittiventris* Ackland, *alishana* Ackland & Suwa, and *perlucida* Ackland.

Anthomyia maculigena Stein, 1913

(Figs 82–92)

Anthomyia maculigena Stein, 1913: 563; Stein, 1919: 147.
Anthomyia griseobasis Malloch, 1924: 269, 273; Emden, 1941*b*: 251, 260; Emden, 1951: 333, 352; Emden, 1956: 529; Paterson, 1956: 164; Zumpt & Patterson, 1952: 98. **Syn. n.**

Syntypes of *maculigena*: SOUTH AFRICA: *KwaZulu-Natal*: 2♂, Durban, in MNM, destroyed in 1956 (Prof. L. Papp, pers. comm.).
Holotype ♀ of *Anthomyia griseobasis* Malloch: SOUTH AFRICA: *KwaZulu-Natal*: 'Holotype' [printed circular white label with red perimeter]; '*Anthomyia* / *griseobasis* / det. / J. R. Malloch Type' [rectangular printed and written white label with black line border]; 'Natal / Estcourt / 10.xi.1913 / R. C. Wroughton' [rectangular white handwritten label]; 'Pres. by / Imp. Bur. Ent. / Brit. Mus. / 1924–242' [rectangular white printed label]. In reasonable condition, right mid leg missing. In BMNH.
Paratypes of *griseobasis*: SOUTH AFRICA: *KwaZulu-Natal*: 1♀, Ulundi, 5–6500 ft, ix.1896, G. A. K. Marshall; 1♂, (labelled as allotype by Malloch). ERITREA (Somaliland): Bohotle, 1903, Vety-Major A. F. Appleton, 1907–89 [this paratype is a male of *Anthomyia ornata* (Bigot)]. KENYA: 1♂, between Nakuru & Baringo, xii.1911, Dr H. A. Bödeker (although not labelled as a paratype, this specimen must be the male paratype listed by Malloch from Kenya Colony, without other data; it carries a label '*Anthomyia griseobasis* Mall. J. R. Malloch det.' and I have added a paratype label). Types of *griseobasis* reviewed during present study.
Other material examined: ANGOLA: 1♀, (A26), Salazar, I. I. A. A., 9–15.iii.1972, Southern African Exp., 1972 (BMNH). CAMEROON: 1♀, Bameda Hosp., 7.xii.1937, 4800 ft, M. D. W. Jeffrys (BMNH). KENYA: 2♂, Embu, 10.iii.1914, G. St. J. Orde Browne (BMNH). 1♂, Karura For., Nairobi, 9–13.xii.1970, A. E. Stubbs, 5500 ft (BMNH); 1♂2♀, Kiambu, vi.1930, R. H. Le Pelley, ex ripe coffee beans (BMNH); 1♂1♀, Nairobi, v.1930, T. J. Anderson, from vegetable marrow (BMNH); 10♂2♀, same locality, vii–viii.1930, van Someren (BMNH); 1♀, same locality, i.1954, van Someren (BMNH); 2♂, Ngong, ix.1925, van Someren (BMNH); 1♂, Jombani Hills, v.1947, van Someren (BMNH). MALAWI: 1♀, Viphia, Chikangawa, SE1133DD, 27.ii–1.iii.1987, J. & A. Londt, grassland & forest margin (NMSA). NIGERIA: 1♂, Obudu Plat., 9.iii.1974, R. G. T. St. Leger (BMNH). SOUTH AFRICA: *Mpumalanga*: 2♀, Waterval Onder, 28.ii.1952, Paterson, (BMNH). *North West*: 2♀, Potchefstroom,



Figs 82–91. *Anthomyia maculigena* Stein. ♂. 82. Thorax, dorsal view (Eastern Cape, South Africa). 83. Ditto, lateral view. 84–91. ♂ terminalia. 84. Cercal plate and surstyli, caudal view (setae on surstyli omitted). 85. Ditto, lateral view. 86. 4th and 5th sternites, ventral view. 87. 5th sternite, lateral view. 88. Gonites. 89. Distal section of aedeagus. 90. Central process of synsternite (6+7). 91. Prehypopygial segments of abdomen.

7.ii.1953, Paterson (BMNH). *Gauteng*: 2♂, no locality, 19.iii.1950, Zumpt (BMNH); 1♂, 5.vi.1950, Zumpt (BMNH); 1♀, 16.xii.1944, Zumpt (BMNH); 1♀, 19.xii.1949, Zumpt (BMNH); 1♂, Johannesburg, 17.xii.1952, Paterson (BMNH); 1♂13♀, 15.x.1951–25.i.1953, Paterson (BMNH). *KwaZulu-Natal*: 1♀, National Park, iii.1932, Miss A. Mackie (BMNH); 1♀, Pietermaritzburg, 9.iii.1954, F. Zumpt (BMNH); 1♀, Cathedral Peak area, 2829CC, J. G. H. Londt, 5–6.ii.1983, ex Malaise (NMSA); 2♂, Majuba, 25.xi.1959, Paterson (BMNH); 1♀, Midlands, Howick, 29°29'S:30°13'E, 10.viii.1991, A. E. Whittington, streamside vegetation, 1060 m (NMSA); 1♀, same locality, 2.x.1991, pan trapped in grass (NMSA); 1♂, Pietermaritzburg, Prestbury, 23.vii.1986, A. E. Whittington (NMSA); 1♀, near Lilani, Ahrens dist., iv.1962, B. & P. Stuckenberg (NMSA); 8♂, Zululand, Ubombo, 28.iv.1955, F. Zumpt (BMNH); 1♀, Umzimkulu, 1.iv.1981, A. C. B. (NMSA). *Eastern Cape*: 1♂, Dwesa Nature Reserve, 32°16'S:28°51'E, 50m, 17–20.xi.1991, D. A. Barraclough, indigeneous forest & margin (NMSA); 1♂, Grahamstown, 4–7.i.1954 (BMNH); 1♂, Port St. John's dist., 16–17.x.1959, B. & P. Stuckenberg, coastal forest (NMSA); 2♂, van Staaden's Pass, Port Elizabeth dist., 30.x.1964, B. & P. Stuckenberg (NMSA); 1♂, Tsitsikamma N. P., 34°51'17"S:23°53'22"E, 8.iv.1998, sweeping understorey veg. in coastal rainforest, A. H. Kirk-Spriggs (NMWN); 1♀, Willowmore, i.1926, Dr Brauns (BMNH). *Western Cape*: 1♀, Algeria Forestry, Clanwilliam Distr., 4–10.iii.1969, Potgieter & Strydom (NMSA); 1♀, 16.5 km NE Clanwilliam, Rheeboksvley picnic area, 3218BB, 4.x.1977, 350 m, R. M. Miller (NMSA); 1♂, Knysna, 9.ii.1960 (BMNH); 1♀, Kloof Nek, Cape Town, 1–2.i.1972, Southern African Exp., 1972 (BMNH). UGANDA: 1♂, Ruwenzori Range, Mobuku valley, xii.1934–i.1935, F. W. Edwards, 7300 ft (BMNH); 1♂, Kigezi Dist., 8170 ft., impenetr. forest, 2–4.xi.1964, R. W. Crosskey (BMNH). ZIMBABWE: 1♀, nr Fort Victoria, ix.1931, J. Ogilvie (BMNH); 1♂, N Vumba, 20.vii.1964, D. Cookson (BMNH); 3♂, 12.i.1965, D. Cookson (NMSA); 1♀, 30.vi.1964, D. Cookson (NMSA); 1♂, Vumba, Umtali dist., iii.1938, A. Cuthbertson (BMNH); 1♀, Mt. Chirinda, 3800 ft, xi.1910, C. F. M. Swynnerton (BMNH).

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to blackish (with rather dense silvery dusting); parafrontals at middle with a brownish suffusion (in some specimens rather obscure); parafacials opposite lunule with a dark shifting sheen stripe which extends from lunule to level of arista, and a brownish non-shifting spot in vibrissal angle which extends above genal groove and reaches eye margin when viewed in profile; face and occiput blackish (with normal dusting), except upper part of occiput rather blackish. Antennae entirely dark brown to blackish. Palpi dark brown to black; arista light brownish in basal half; prementum dark brown, thinly dusted. Thorax (Figs 82, 83) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface, viewed from in front (at a low angle) the presutural whitish dusted areas becoming dark sooty grey (less contrasting); transverse postsutural band across the scutum wide (extending from suture to beyond 2nd postsutural dorsocentral setae; complete between wing bases (anterior and posterior margins weakly sinuate); presutural spots large and square, joined behind head, each spot expanded towards presutural acrostichal rows (inner margins diverging) and reaching or extending posteriorly beyond 2nd presutural dorsocentral seta; scutellum almost completely black, with only its extreme tip silvery grey. Pleura largely grey dusted, in parts rather shifting depending upon angle of vision, and turning to a rather greasy golden grey from certain angles (especially notopleural depression). Abdomen largely densely dusted over dark ground-colour, with extensive contrasting black and grey pattern on tergites; basal tergites sometimes obscurely orange-brown (a wide black central vitta on 3rd and 4th tergite as wide as or wider than depth of hind femur, joined anteriorly on each tergite with a wide black band which expands laterally to full length of tergites; pregenital sclerite contrastingly shining brownish black (undusted); hypopygium rather finely dusted, 5th sternite shining reddish brown laterally on processes, the flattened lobes on processes sclerotised and less shining. Wing membrane pale brownish orange tinged; wing bases with brown veins; squamae slightly paler than wing base with whitish fringes; halteres yellow. Legs dark brown or orange-brown, trochanters and coxae orange, latter rather dusted.

Head: Parafrontalia very narrow posteriorly (almost touching on nearly half length of frons), widening anteriorly to three-quarters width of first flagellomere; eyes almost touching, separated by less than half width of anterior ocellus; parafacial narrow (only about one-third width of first flagellomere); genae below lowest point of eye margin 0.15–0.2 times eye-height. 2 pairs of short and weak parafrontal setae on anterior third of distance between antennal base and anterior ocellus; short proclinate interfrontal setulae present, closer to lunule than to anterior ocellus. First flagellomere nearly three times as long as wide (apex not quite reaching lower facial margin); arista tapering from base to apex (not abruptly narrowing in distal two-thirds), about 1.6 times length of first flagellomere, short plumose, total width of hairing two-thirds width of first flagellomere, longest hairs (on dorsal surface) three times diameter of base. Prementum about 0.35 times as long as head height.

Thorax: 3 pairs of presutural acrostichals (the middle the longest, at about two-thirds length of 2nd presutural dorsocentral seta) in rows separated by about distance from each to adjacent dorsocentral row, without additional setulae in between; acr / dc ratio 1:1:1; posthumerals 1 + 1; prealar longer than (1.5 times) posterior notopleural; dorsal surface of scutellum bare centrally; katepisternals 2 + 2(3), lower posterior nearly as long as upper posterior seta, lower anterior short and fine; anepisternum with a developed upper anterior setula.

Legs: f2 with row of 3–5 pv on about basal third; f3 with 7–9 av in distal two-thirds; t1 with 1 pv; t2 with 1 very short ad, 2 pd and 3 pv; t3 with 1 av, 5 ad, 2 pd and 6–7 pv.

Wing: costa with all marginal spinules very short; the pair before distal break not differentiated; lower crossvein sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.4 times length of preceding section. Lower squama as long as upper.

Wing length up to 6.0 mm.

Abdomen: about twice as long as wide, semi-compressed in basal two-thirds. 4th sternite (Fig. 86) about 1.3 times as long as wide, with a rounded posterior margin, densely clothed with long setae posteriorly. 5th sternite processes (Fig. 86) with a few short setae laterally at their bases, otherwise with long bi-triserial rows of setulae on their concave inner margins; membranous lobes (Fig. 87) strongly sclerotised and darkened, their lower margins turned at a 45° angle to the processes, forming flat plates which are inwardly directed when viewed ventrally; in lateral view with strongly projecting and rounded lower margins; the apical setulae long and separated from the basal setulae (distinct gap in lateral view). Central process of synsternite (6+7) (Fig. 90) large, with divergent winged arms. Surstylus (Fig. 85) strongly downcurved, constricted medially in lateral view, bearing a ventral row of rather long setulae and 2 short spinules below the angle of its inner lobe. Cercal plate (Fig. 84) of about equal length and width, with a few short apical spinules and 1 pair of longer setulae on either side of them, otherwise setulose only on basal half, in profile apex slightly projecting, but concealed behind surstylus. Pregonite (Fig. 88) with 2 expanded setulae on apical margin, parallel-sided; postgonite (Fig. 88) with a slightly expanded setula (with outer lobe slightly projecting above its base). Distal section of aedeagus (Fig. 89) with a long proclinate dorsal process hardly separated from its base, dorsal margin of distal section straight in lateral view.

Female:

Colour: Head dark as in male; parafrontal with a brownish spot at the bases of the two anterior orbital setae, (sometimes only the anterior one) which continues as a suffused brownish shading across frontal stripe (at level of cruciate interfrontal setulae). Thoracic pattern very similar to that of male, scutal band and presutural spots almost as extensive, viewed from a low angle in front the grey dusted areas are not so shifting, remaining largely silvery grey and more contrasting with the dark spots; scutellum with apical grey spot equally small as male, base of scutellum often narrowly grey dusted. Pleura (including notopleural depression) generally dark in ground colour, rarely slightly reddish or orange. Abdomen with tergites either dark in ground-colour, or often extensively orange or yellow, with central and lateral black marks only narrowly connected along anterior margins of tergites. Legs dark to orange-brown.

Head: Eyes widely separated (by slightly more than their transverse width, ratio 5:6:5); interfrontalia at level of middle orbitals about 4 times as wide as each parafrontal; parafrontalia widening anteriorly to about width of first flagellomere (frontal stripe rather short, not longer than wide, lateral margins convex); genae below lowest point of eye margin about 0.25 times eye height. Antennae and arista tapering as in male. Parafrontal setae differentiated into 3 pairs of orbital setae (anterior setae normally proclinate, posterior two reclinate) + 1 pair of (inwardly directed) frontal setae at level of lunule; crossed interfrontal setulae well developed, their tips reaching margins of frontal stripe.

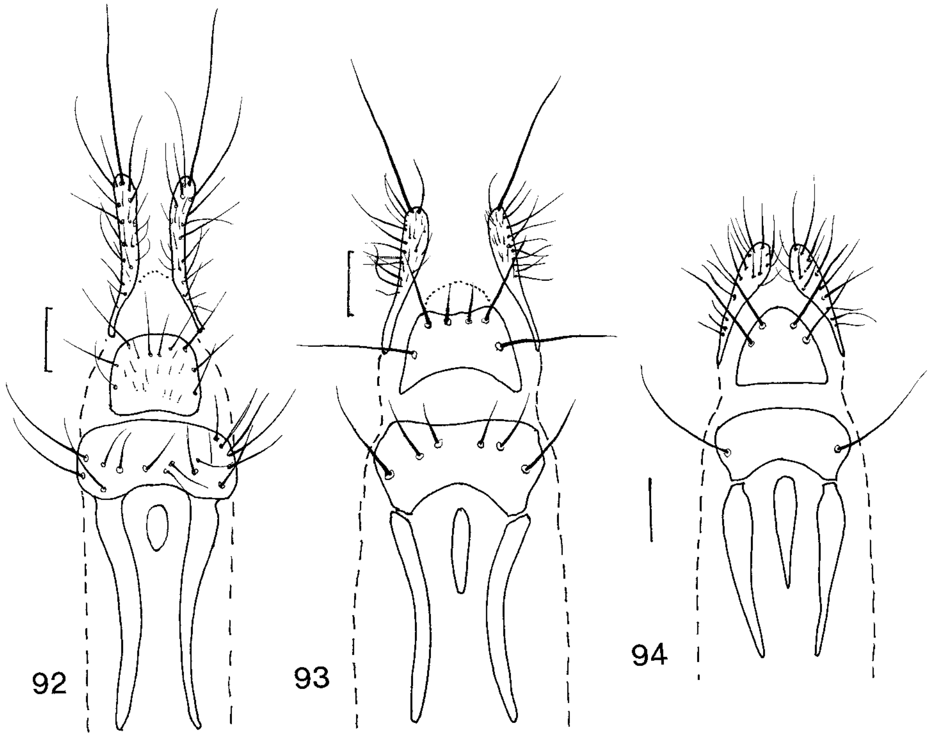
Thorax: Presutural acrostichal setulae similar to those in male. katepisternals 2 + 2 (dorsal anterior seta 2/3 length of posterior dorsal seta, ventral setae both short and fine, about half length of dorsal anterior).

Legs: f2 with 0 av; f3 with 4–5 short av, and 2 preapical pv; t1 with 1 ad, 1 av (both short); t2 with 1 ad, 2 pd and 2 p/pv; t3 with 0–1 av, 5 ad and 2 pd.

Wing length up to 7.0 mm.

Abdomen: Postabdomen (Fig. 92) equal in length to preabdomen, otherwise not significantly different from *A .benguellae*.

Discussion: Stein described *maculigena* from two males (Durban) in 1913. His excellent description agrees exactly with the male of the species which was described from a female as *griseobasis* by Malloch in 1924. The following extracts from Stein's description are significant: '…die Backen neben dem Mundrand mit einem fast viereckigen schwarzen Fleck…' 'Borste kurzhaarig' 'Thorax…2 grosse Vorderrandflecke, die vorn



Figs 92–94. ♀ apical segments of ovipositors. 92. *Anthomyia maculigena* Stein (Angola). 93. *Anthomyia whitei* sp. n. (paratype, Ethiopia). 94. *Anthomyia stuckenbergi* (paratype, KwaZulu-Natal, South Africa).

ziemlich breit zusammenhängen, seitlich sich bis zu den Schulterbeulen erstrecken und nach hinten bis nahe zur Naht gehen, eine sehr breite Querbinde hinter der Naht, die über 2/3 so breit ist als die Entfernung zwischen Naht und Schildchen…' 'Schildchen samtschwarz, letzteres kaum an der Spitze mit hellem Punkt; pra mässig lang…' 'Flügel…ohne Randdorn…'. [genae next to mouth margin with an almost rectangular black spot…arista short haired…thorax with two large foremarginal spots which are rather broadly joined in front, at the sides they reach as far as the post pronotal lobes and behind reach nearly to suture…a very wide postsutural band which is over 2/3 as wide as the distance between suture and scutellum…scutellum velvet black, the latter barely with a light spot at apex….prealar moderately long…wings without costal spine' (my translation)].

When Malloch described *griseobasis* he designated a female (Estcourt, Natal) as the holotype, because the parafrontals had a conspicuous brown spot at the base of the proclinate seta, and a trace of a brown band across the frontal stripe; these characters being unique amongst *Anthomyia* females in Malloch's experience. In fact the females of some specimens of *ornata* have a darkened spot around the seta, and in some specimens of *maculigena* this is absent. The 'allotype' of *griseobasis* (=♂ paratype) from Somaliland, Bohotle, is a male of *Anthomyia ornata* (Bigot) (genitalia dissected). The male paratype from 'Kenya Colony' was found in the BMNH without a paratype label, which I have added.

Although Stein's types are destroyed, there is no doubt that *maculigena* is the earliest valid name for this species.

In 1924 Malloch's only reference to *maculigena* is a note at the end of the entry for '*abyssinica* Jaen.' (misidentification), where he suspected that *maculigena* Stein might be a synonym of *abyssinica*. He obviously did not read Jaennicke's or Stein's descriptions carefully enough. In this paper '*abyssinica* Jaen.' of Malloch is described as *subabyssinica* sp. n.

Emden (1951) listed material of *griseobasis* from numerous localities. The ♂♀ from Uganda (Ruwenzori, Namwamba Valley, 6500 ft., F. W. E[dwards] , and the ♀ from Kenya (Katamayo) are misidentified, and described in this paper as *concava* sp. n. The ♂ from the Belgian Congo (Tshibinda, T. D. A. Cockerell) is a specimen of *abyssinica* Jaen. (arista with long hairs, costa of wing with less obvious costal spine, but genitalia dissected and agree with *abyssinica*. Most of the other records appear to be correct. Paterson (1956) recorded a female of *maculigena* (as *griseobasis*) from Msingi (?Tanzania); he was rather doubtful about its identity, and from the characters given it cannot be *maculigena*.

The larvae of *maculigena* have been recorded as feeding on ripe coffee beans (Emden 1951), from vegetable marrow (Emden 1951), on meat and stool (Zumpt & Patterson 1952).

Distribution: From Uganda and Kenya in east Africa, to Nigeria and Cameroon in west Africa, southwards to Zimbabwe, South Africa and Angola.

Anthomyia ornata (Bigot, 1885)

(Figs 95–102)

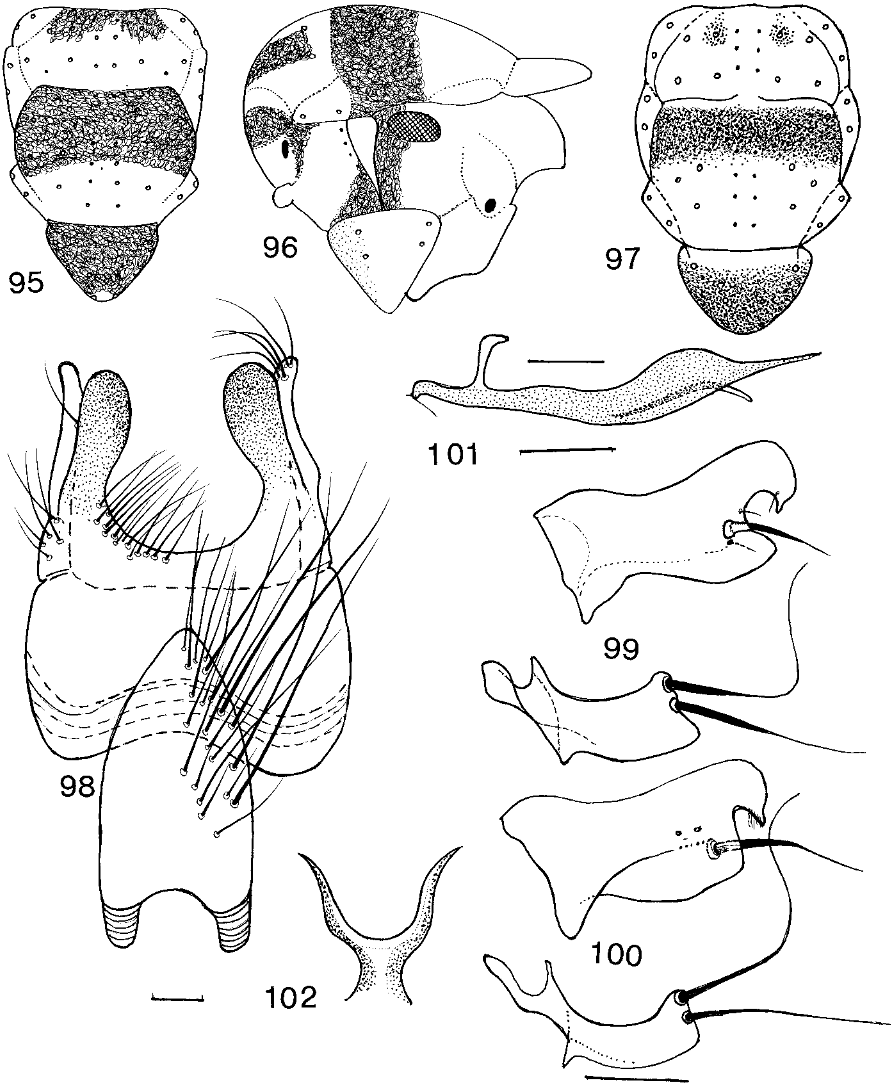
Hylemyia ornata Bigot, 1885: 300; Stein, 1907: 282; Stein, 1908: 173; Bezzi, 1908: 96.

Anthomyia ornata: Stein, 1913: 564; Stein, 1919: 147; Malloch, 1924: 268, 272; Emden, 1941*b*: 260; Pont & Ackland, 1980: 715; Pont, 2000: 21.

'*Anthomyia griseobasis* Malloch.' Malloch, 1924: 273 (in part).

Holotype ♀ of *ornata*: SOUTH AFRICA: *KwaZulu-Natal*: standing over the label: '*H.*[*ylemyia*] *ornata* ♀ / Port Natal J. Bigot' [rectangular white handwritten label with black line border]; on the pin: 'Holotype' [white printed label with red perimeter]; 'Ost Afrika / Port Natal / (coll. Bigot)' [rectangular blue handwritten label]; 'H. ornata / EX COLL. BIGOT' [white rectangular printed and handwritten label]. The specimen is rather damp, with some setae rubbed off. In UMO, revised during present study.

Material examined: ANGOLA: 15 mls N Sa da Bandiera, *ca.* 6500 ft, 3.iii.1972, Southern African Exp., 1972 (BMNH). NAMIBIA: 14♂33♀, Brandberg, Wasserfallflache at: 21°10'42"S:14°32'56"E, 2000 m, 19–21.x.1998, R. Butlin & J. Altringham, yellow pan traps 8 (NMWN). SOMALIA: 1♂, Bohotle, 1903, Vety-Major A. F. Appleton, (paratype of *Anthomyia griseobasis* Malloch) (BMNH). SOUTH AFRICA: *Mpumalanga*: 1♂, Gladdespruit River, nr. Nelspruit airfield, 2530DB, 2975 ft, 23.ii.1971, B. Stuckenberg, streamside bush (NMSA); 2♂, Houtbosloop River, nr. Rivulets, Nelspruit dist., 2530BC, xi.1970, B. Stuckenberg, gallery forest (NMSA). *North West*: 2♂, Brits, 7.iii.1955, Paterson, under fig (BMNH); 1♂, same locality but 8.iii.1955, near water in kloof (BMNH); 1♂1♀, Ottoshoop, iv.1916, H. G. Breyer (NMSA).). *Gauteng*: 1♀, Irene, 23.viii.1970, Dr C. K. Brain (NMSA); 1♂, Johannesburg, i.1971 (BMNH); 1♂, Johannesburg, Parktown North, 1.ii.1930 (BMNH). *KwaZulu-Natal*: 2♂, Hluhluwe, 29.vi.1973, Zumpt (BMNH); 1♀, Ndumu, 25.iv.1956, Paterson (BMNH); 1♂, Pietermaritzburg, Town Bush, 4.v.1972. B. & P. Stuckenberg (NMSA); 1♀, same data but 5.vii.1956 (NMSA); 1♂, Maritzburg, 25.xii.1903, Paulus (NMSA); 1♂, Gillitts, Pinewood dist., 29.xi.1962, B. & P. Stuckenberg (NMSA); 1♂, Karkloof, 18.xi.1961, T. Schofield (NMSA); 1♂, Weenen, iv. 1924, H. P. Thomaseet (NMSA); 1♀, same data (BMNH); 1♀, Howick, 29°28'40"S:30°13'20"E, 8.viii.1990, A. E. Whittington, mercury blended light (NMSA); 1♂, Marley, Durban, i.1915 (NMSA). *Eastern Cape*: 1♀, Katberg, 15–30.i.1933, R. E. Turner (BMNH). *Western Cape*: 1♀, Mossel Bay, ii.1922, R. E. Turner (BMNH).



Figs 95–102. *Anthomyia ornata* (Bigot) ♂. 95. Thorax, dorsal view (KwaZulu-Natal, South Africa). 96. Ditto, lateral view (KwaZulu-Natal). 97. Thorax, dorsal view (Namibia). 98–102. ♂ terminalia (all from KwaZulu-Natal, except 100). 98. 4th and 5th sternites, ventral view. 99. Gonites. 100. Gonites (Namibia). 101. Distal section of aedeagus. 102. Central process of synsternite (6+7).

Male: Similar to *A. maculigena*, differs as follows:

Colour: Head with the brownish non-shifting spot in vibrissal angle extending above genal groove and almost or completely reaching eye margin when viewed in profile, but more narrowly than in *maculigena*. Thorax (Figs 95, 96) with transverse postsutural band across the scutum complete between wing bases but anterior and posterior margins more or less straight; presutural spots smaller, generally joined behind head (in some examples the spots are discrete), and not reaching or extending posteriorly much beyond 1st presutural dorsocentral seta; scutellum almost entirely black, with only its tip and along base silvery grey. Pleura (including notopleural depression) partly orange in ground- colour under grey dusting. Abdomen largely densely dusted over black to orange ground-colour, with extensive contrasting black and grey pattern on tergites, central vitta as wide as depth of hind femur (absent on 1st and 2nd tergites) and joined to a brownish black crossband on anterior third of tergites which widens along lateral margins to about half width of tergite; hypopygium and 5th sternite largely orange in ground-colour; 5th sternite shining reddish brown laterally on processes, the flattened lobes on processes sclerotised and semi-shining. Legs largely orange-brown, especially femora and tibiae in basal half, trochanters and coxae orange, latter rather dusted.

Head: As in *maculigena*, short proclinate interfrontal setae apparently absent.

Thorax: Prealar seta 1.2–1.5 times length of posterior notopleural seta.

Wing length up to 6.0 mm.

Abdomen: slightly more than twice as long as wide, semi-dorsoventrally compressed in basal two-thirds in lateral view. 4th sternite (Fig. 98) about twice as long as wide, with a pointed posterior margin. Pregonite (Fig. 99) longer than *maculigena*, constricted in middle with a concave dorsal margin; postgonite with a less expanded setula (with outer lobe strongly projecting above its base). Distal section of aedeagus (Fig. 101) with a long proclinate dorsal process separated from its base by its length.

Female: Similar to the female of *maculigena* except for the following differences:

Colour: Thoracic pattern with presutural spots reduced (as in the male; in some specimens they are not joined behind head), scutellum base often narrowly grey dusted. Pleura (including notopleural depression) generally pale orange in ground colour, with areas of translucent orange under grey dusting. Abdomen with tergites extensively orange or yellow, with central and lateral black marks only narrowly connected along anterior margins of tergites. Legs largely orange, femora and tibiae darker in distal half.

Wing length up to 7.0 mm.

Discussion: Malloch (1924) listed two males as '*ornata* Bigot var.?' (Estcourt and Upper Tongaat, Natal) which differed from *ornata* as follows: anepisternum without a black mark on lower posterior angle; hind femur with an almost complete series of sparse pv setae; presutural black spots on thorax round, isolated on disc. These specimens represent a distinct species, with genitalia quite different from *ornata*, but very similar to those of *subabyssinica* sp. n. This species is described in this paper as *subornata* sp. n.

Emden (1941*b*) only mentioned *ornata* in a key, and did not comment on Malloch's *ornata* var.

The specimens from Namibia have a rather different appearance from typical *ornata* from Natal. Thorax (Fig. 97) with the dark markings much reduced, presutural spots small and isolated, postsutural band much narrower (hardly reaching 2nd postsutural dorsocentral seta) and base of scutellum grey dusted at base. The genitalia (gonites Fig. 100) hardly differ from typical *ornata.*

Distribution: Apart from the single male from Somalia, all material of *ornata* is from South Africa, Angola and Namibia. The species will probably be found in East African countries between South Africa and Ethiopia.

Anthomyia whitei sp. n.

(Figs 93, 102a–113)

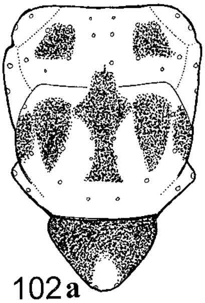
Holotype ♂: ETHIOPIA: 'Holotype' [circular white label with red perimeter]; 'ETHIOPIA: / Prov. Gojjam / G. B. White, / BMNH. 1973–298' [rectangular white printed label]; 'ex. gelada baboon / faeces, Mt. Choke / 3500 m, 20.xii.1972' [rectangular white handwritten label]; 'HOLOTYPE ♂ / *Anthomyia* / *whitei* / D. M. Ackland' [rectangular red printed label]. Right mid leg missing, slightly teneral, otherwise in good condition; genitalia dissected and mounted in a plastic tube on staging pin. In BMNH.

Paratypes: ETHIOPIA: 6♂14♀, same data as holotype; 1♂, Addis Ababa, Entotto, 17.x.1968, R. Kano & T. Ohse, 3000 m : 4♀, Addis Ababa, I. C. L. R. I., 16.x.1968, R. Kano & T. Ohse, 2700 m. ERITREA: 1♂, Senafe dist., 5.v.1948, G. de Lotto (all in BMNH).

Etymology: This species is named in honour of Dr G. B. White who discovered this species in the Ethiopian Highlands.

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to reddish (with rather dense silvery dusting); parafrontals opposite lunule with a reddish brown shifting sheen stripe which extends from lunule to level of arista, and a reddish spot in vibrissal angle which does not extend above genal groove when viewed in profile; face and occiput blackish (with normal dusting), including upper part of occiput. Antennae entirely dark brown to blackish. Palpi dark brown to black; arista brownish at base; prementum dark brown, very thinly dusted hence semi-shining especially basally. Thorax (Figs 102*a*, 103) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface; transverse postsutural band across the scutum either divided into 5 spots (Fig. 102*a*), the median spot extended anteriorly beyond suture and reaching level of 3rd postsutural dorsocentral seta (and behind suture constricted medially), or complete between wing bases (Fig. 104) (lateral spots fused and reaching wing bases, median spot fused laterally to a greater or lesser degree anteriorly to adjacent spot); presutural spots either small, separated behind head, each spot filling the space between presutural dorsocentrals and posthumeral setae, or larger and obscurely darkened anteriorly to foremargin of thorax; scutellum black, with a grey dusted apical spot which reaches anteriorly to discal setulae. Pleura largely grey dusted, only lower part of the post pronotal lobes and anterior corner of anepisternum brownish black. Abdomen largely densely dusted over dark ground-colour, with contrasting black and grey pattern on tergites (black central vitta on 3rd and 4th tergite nearly as wide as depth of femur, joined on anterior margins of tergites to a black crossband which is about one third length of tergite, laterally not widened to more than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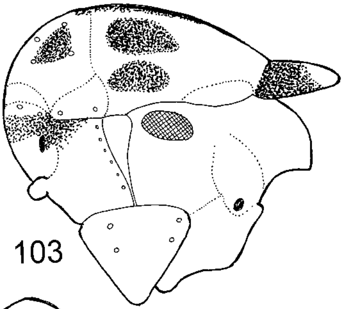
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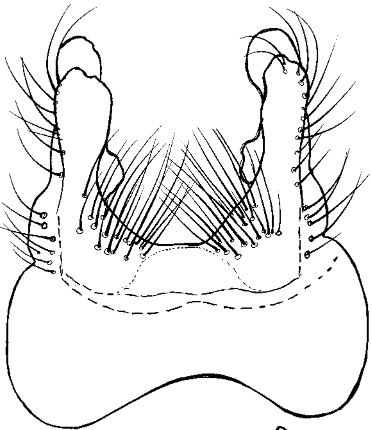
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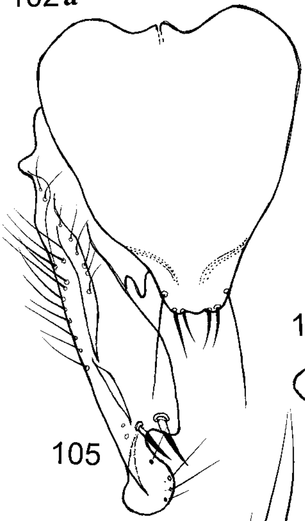
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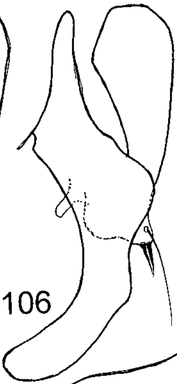
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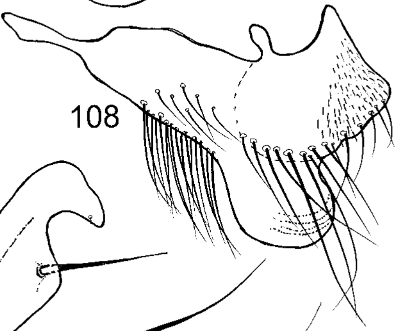
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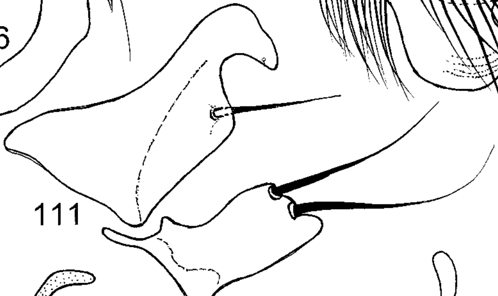
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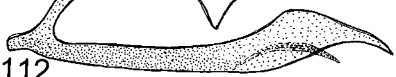
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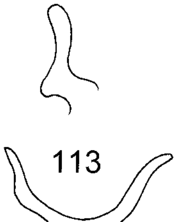
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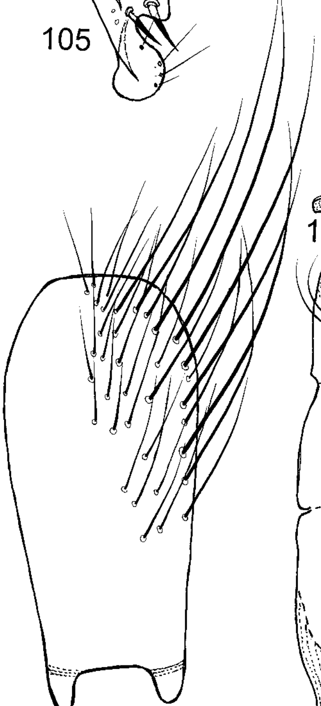
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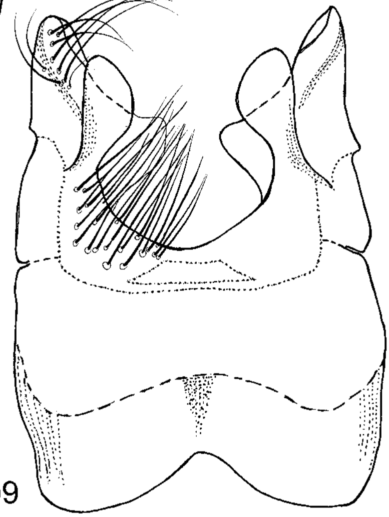
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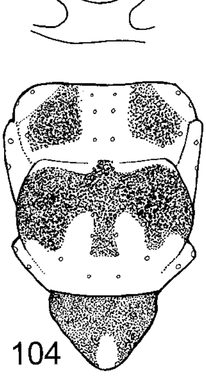

104

half length of tergite; hypopygium and 5th sternite rather finely dusted. Wing membrane hyaline with light brown veins; squamae white with whitish fringes; halteres yellow. Legs entirely dark brown to blackish, grey dusted, trochanters orange.

Head: Parafrontalia very narrow posteriorly (touching for a short distance in upper frons half), widening anteriorly to width of first flagellomere; eyes separated by width of anterior ocellus; genae below lowest point of eye margin 0.15–0.16 times eye-height. 2 pairs of parafrontal setae on anterior third of distance between antennal base and anterior ocellus; interfrontal setulae present which are nearly as long as posterior frontal setae. First flagellomere more than twice (2.5 times) as long as wide (apex not quite reaching lower facial margin); arista tapering from base to apex (not abruptly narrowing in distal two-thirds), about twice length of first flagellomere, very short pubescent, longest hairs about as long as diameter of base. Prementum about 0.35 times as long as head height.

Thorax: 3 pairs of presutural acrostichals (the middle the longest) in rows separated by slightly more than distance from each to adjacent dorsocentral row, with 4–6 additional setulae in between; acr / dc ratio 9:10:9; posthumerals 1 + 1; prealar of same length as posterior notopleural; dorsal surface of scutellum with numerous setulae on disc, at most narrowly bare medially; katepisternals 2 + 2, lower posterior three-quarters length of upper posterior seta, lower anterior half length of upper anterior seta; anepisternum with a well developed upper anterior setula.

Legs: f2 with row of 5–6 pv on about basal half, 0 av; f3 with 9 av in distal three-quarters; t1 with median 1 pv; t2 with 1 strong ad (longer than diameter of tibia), 1–2 pd and 2p/pv; t3 with 1 av, about 5 ad, 2 pd and 2–3 pv.

Wing: costa with all marginal spinules short (not longer than diameter of costa); the pair before distal break not differentiated; lower cross-vein sinuate, joining M_{1+2} obliquely; last section of M_{1+2} equal in length to preceding section. Lower squama as long as upper.

Wing length up to 7.0 mm.

Abdomen: about 2.75 times as long as width at 3rd tergite, dorsoventrally compressed in basal two-thirds, more or less parallel-sided. 4th sternite nearly twice as long as wide, rectangular, with a more or less straight posterior margin, with long lateral setae but only short setulae posteriorly. 5th sternite processes (Figs 107, 109) with a few short setae laterally at their bases, otherwise with long irregularly multiserial rows of setulae on their concave inner margins; membranous lobes (Fig. 108) wide and large, projecting ventrally in lateral view, the apical setulae long and separated from the basal setulae (distinct gap in lateral view). Central process of synsternite (6+7) (Fig. 113) with long divergent arms. Surstylus (Figs 105, 106) downcurved, ventral margin regularly curved in lateral view, slender apically, bearing a ventral row of rather long setulae and 2 short spinules below the angle of its inner lobe; in profile (Fig. 106) upper dorsal

Figs 102*a*–113, *Anthomyia whitei* sp. n. ♂ (paratypes). 102a. Thorax, dorsal view (Ethiopia, Mt Choke). 103. Ditto, lateral view. 104. Thorax, dorsal view (Ethiopia, Kano). 105–113. ♂ terminalia. 105. Cercal plate and surstylus, caudal view. 106. Ditto, lateral view (setae omitted). 107. 5th sternite, ventral view (Mt Choke). 108. Ditto, lateral view. 109. 5th sternite, ventral view (Ethiopia, Kano). 110. 4th sternite, ventral view (Kano). 111. Gonites (Mt Choke). 112. Distal section of aedeagus (Mt Choke). 113. Central process of synsternite (6+7).

margin with a moderately developed lobe. Cercal plate (Fig. 105) of about equal length and width, apex rather blunt, with a few short apical spinules and 1–2 pairs of longer setulae on either side of them, otherwise setulose only on basal half, in profile apex not projecting, concealed behind surstylus. Pregonite (Fig. 111) twice as long as wide, with 2 slightly expanded setulae on distal margin; postgonite (Fig. 111) with a slender setula (inserted on ventral margin). Distal section of aedeagus (Fig. 112) with a proclinate dorsal process only slightly separated from its base, dorsal margin of distal section straight in proximal half.

Female:

Colour: Head dark as in male. Thoracic pattern very similar to that of male, with scutal markings slightly less extensive; postsutural band either separated into 5 spots, or these weakly joined anteriorly, lateral spots either joined or separated from wing bases; scutellum with apical grey spot often larger than the male. Abdomen with black and grey pattern on abdominal tergites similar to that of male (or in some specimens with central and lateral black marks separate, not or only weakly connected along anterior margins of tergites). Legs dark as in male (tibiae sometimes obscurely orange).

Head: Eyes widely separated (by slightly more than their transverse width, ratio 10:11:10); interfrontalia at level of middle ors about 3.6 times as wide as each parafrontal; parafrontalia widening anteriorly to slightly more than width of first flagellomere; genae below lowest point of eye margin about 0.3 times eye height. Arista tapering as in male. The strong parafrontal setae differentiated into 3 pairs of orbital setae (anterior setae normally proclinate, posterior two reclinate) + 1 pair of (inwardly directed) frontal setae; crossed interfrontal setae well developed, their tips reaching margins of frontal stripe.

Thorax: Presutural acrostichal setulae as in male. Katepisternals 2 + 2, (both lower setae about half length of upper setae).

Legs: f2 with 1–2 av and 2–3 pv on basal half; f3 with 6 irregularly spaced av, and 1 preapical pv; t1 with 2 p; t2 with 1 strong ad, 2 pd and 2 p/pv; t3 with 1 av, 5–6 ad and 2 pd.

Wing length up to 8.0 mm.

Abdomen: Postabdomen (Fig. 93) equal in length to preabdomen. Similar to other species of *Anthomyia*). Cerci rather widely spaced basally.

Discussion: *A. whitei* was first discovered in 1972 by Dr G. B. White, breeding in faeces of gelada baboon, *Theropithecus gelada* (Rüppel) (Cercopithecidae), in the Ethiopian highlands. Immature stages were found often in gelada stools on lookout rocks. *A. whitei* larvae and pupae in various stages diapaused together when the faeces dried up, resuming development when rain moistened the faeces and washed it into more suitable situations. Further adult specimens were found in a collection from Addis Ababa made in 1948, and a male from Eritrea was found in the BMNH. According to Graham White, adults apparently of this species were commonly seen alighting on rocks in gelada territory and other organic materials in several parts of the Ethiopian highlands.

A. whitei is related to *A. stuckenbergi* from South Africa (and the other species of the *ornata* superspecies). The form of the postgonite (with seta arising from the inner surface) long arms on synsternite (6+7) processes, a strong sub-basal dorsal process on the distal section of the aedeagus, long inner marginal setae and a large ventrally directed membranous lobe on the processes of the 5th sternite are constitutive characters of the *ornata* superspecies.

Distribution: Only known from Ethiopia and Eritrea.

Anthomyia stuckenbergi sp. n.

(Figs 94, 114–122)

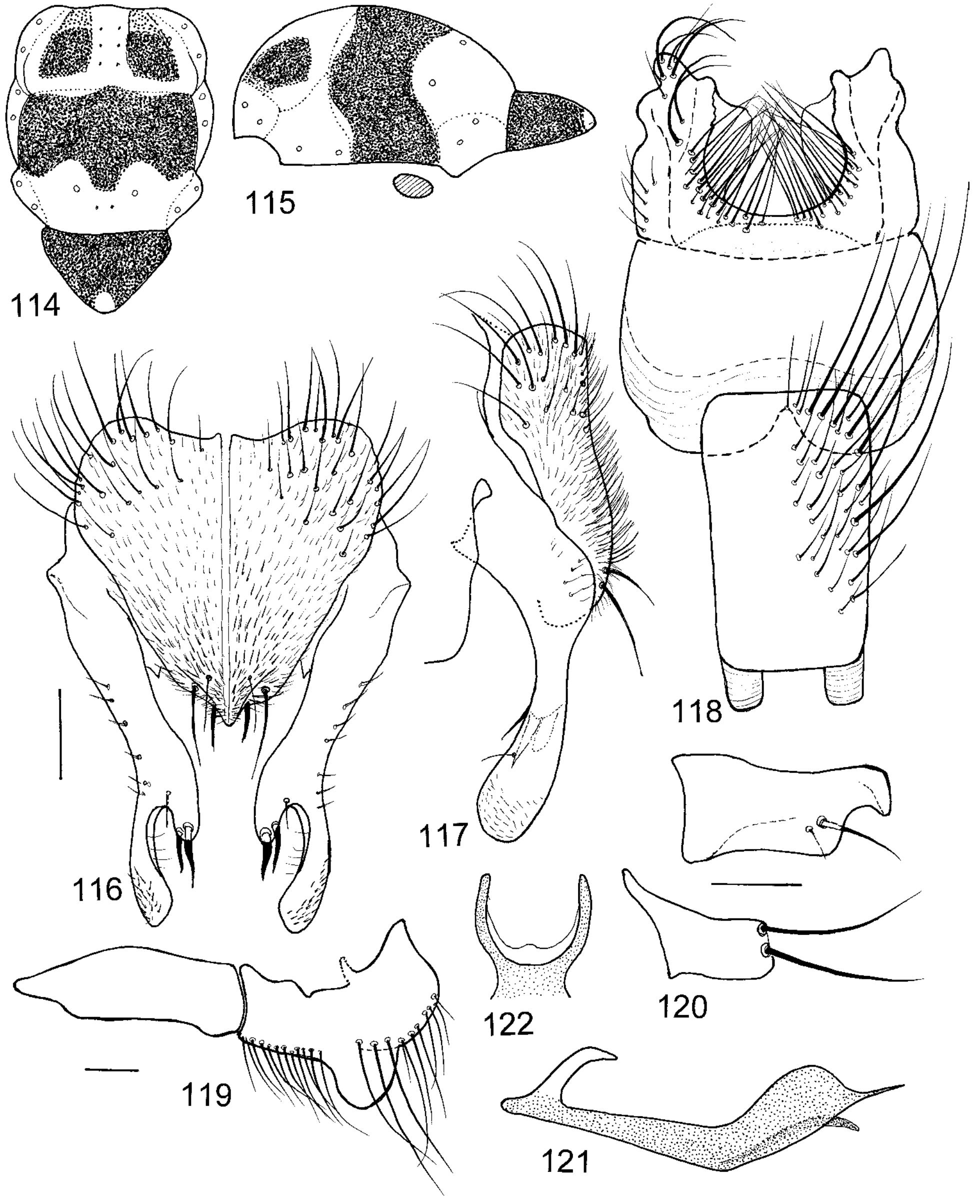
Holotype ♂: SOUTH AFRICA: *KwaZulu-Natal*: 'Royal Natal / National Park / Drakensberg Mts./ B. & P. Stuckenberg'; 'from montane forest / 12.ix.63 / 1500 m.' 'HOLOTYPE ♂ / *Anthomyia* / *stuckenbergi* / Ackland' [Rectangular red printed and written label] 'Holotype' [circular white label with red perimeter]. In good condition. Genitalia dissected and mounted in balsam on a plastic slip on the pin (NMSA).

Paratypes: SOUTH AFRICA: *KwaZulu-Natal*: 4♂3♀, Royal Natal National Park, Drakensberg Mts., 16.ix.1963, 1530 m, B. & P. Stuckenberg, from montane forest (NMSA); 1♀, same locality but 2282DB, 28–29.iv.1984, J. Londt, forest margins & grasslands (NMSA); 1♂, Giant's Castle Res., Drakensberg, 18–23.ix.1961, 5800 ft, B. & P. Stuckenberg (NMSA); 1♂, same locality, ii.1970 [no further data] (NMSA); 1♂, Town Bush, 28.vii.1981, R. Elfenink [no further data, presumably Pietermaritzburg] (NMSA); 1♂, Ulundi, ix.1896, 5000–6000 ft, G. A. K. Marshall (BMNH). *Western Cape*: 3♂, 12 km SW Clanwilliam Kransvlei R., 3218BB, 5.x.1977, R. M. Miller (NMSA).

Etymology: This species is named in honour of Dr Brian Stuckenberg, the distinguished Dipterist and collector of so much valuable African material.

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to blackish (with rather dense silvery dusting); parafrontals opposite lunule with a shifting brownish sheen stripe which extends from lunule to level of arista, and a brownish non-shifting spot in vibrissal angle which extends between genal groove and eye margin (in some examples not quite reaching eye margin) when viewed in profile; face and occiput blackish (with normal dusting), except upper part of occiput rather shining blackish. Antennae dark brown. Palpi dark brown to black; arista brownish but paler in basal half; prementum dark brown, very thinly dusted and rather shining. Thorax (Figs 114, 115) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface, when viewed from in front the silvery dusting is rather shifting and becomes greyer; transverse postsutural band across the scutum complete between wing bases, anterior margin very slightly, posterior margin distinctly sinuate, the posterior median projection reaching level of posterior dorsocentral seta; presutural spots large, separated behind head, each spot filling the space between presutural dorsocentrals and posthumeral setae and continuing anteriorly to front margin of thorax (inner margins more or less parallel); scutellum largely black, with only its tip silvery grey. Pleura largely grey dusted, lower part of the post pronotal lobes, anterior corner of anepisternum and anterior part of anepimeron darkened. Abdomen largely densely dusted over dark ground-colour, with contrasting black and grey pattern on tergites, except 1st and 2nd tergites expanded anteriorly on each tergite in to a black band which is not quite half length of tergite, and which is two-thirds length of tergites laterally; sternites orange-brown; pregenital sclerite contrastingly shining blackish (undusted); hypopygium and 5th sternite rather finely dusted. Wing membrane and veins pale brownish tinged; wing bases with whitish membrane and white root vein; squamae white with whitish fringes;



Figs 114–122. *Anthomyia stuckenbergi* sp. n. ♂ (paratype, KwaZulu-Natal). 114. Thorax, dorsal view. 115. Ditto, lateral view. 116–122. ♂ terminalia. 116. Cercal plate and surstyli, caudal view. 117. Ditto, lateral view. 118. 4th and 5th sternites, ventral view. 119. 5th sternite, lateral view.120. Gonites. 121. Distal section of aedeagus. 122. Central process of synsternite (6+7).

halteres yellow. Legs dark brown to blackish (except for the partly shining orange trochanters and orange-brown bases to femora).

Head: Parafrontalia very narrow posteriorly, touching or almost touching for one-third of frons length (frontal stripe obsolescent here), widening anteriorly to slightly less than width of first flagellomere; eyes separated by width of anterior ocellus; genae below lowest point of eye margin 0.26–0.28 times eye-height. 2 pairs of parafrontal setae on anterior half of distance between antennal base and anterior ocellus; very fine short hair-like interfrontal setulae present or absent at middle of frons. First flagellomere twice as long as wide (apex not quite reaching lower facial margin); arista tapering from base to apex (not abruptly narrowing in distal two-thirds), nearly twice length of first flagellomere, short pubescent, longest hairs not as long as diameter of base. Prementum about 0.4 times as long as head height.

Thorax: 3 pairs of relatively strong presutural acrostichals (the middle the longest) and about three-quarters length of anterior presutural dorsocentral setae, in rows separated by about distance from each to adjacent dorsocentral row, without additional setulae in between; acr / dc ratio 1:1:1; 1 + 1 posthumerals; prealar of same length or slightly longer than posterior notopleural; dorsal surface of scutellum bare centrally, setulose towards sides; katepisternals (2)1 + 2(3), lower posterior nearly as long as upper posterior seta; anepisternum with a distinct upper anterior setula

Legs: f2 with row of 6–7 pv on about basal half, 0 av; f3 with 8 av in distal three-quarters, no developed pv; t1 with median 1 pv; t2 with 1 very short ad, 1–2 pd and 2 p/pv; t3 with 1 av, 6 ad, 2 pd and 3–4 pv.

Wing: costa with all marginal spinules short; the pair before distal break not differentiated; lower crossvein sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.3 times length of preceding section. Lower squama as long as upper.

Wing length up to 6.8 mm.

Abdomen: 4th sternite (Fig. 118) about 1.5–2 times as long as wide, more or less parallel-sided with a straight posterior margin which is densely clothed with long setae laterally and posteriorly. 5th sternite processes (Fig. 118) short, with 3–5 short setae laterally at their bases, otherwise with multiserial rows of long setulae on their concave inner margins, their tips touching on mid line; membranous lobes (Fig. 119) subapical, projecting ventrally in lateral view, apically rounded, the apical setulae very long as are the inner basal setulae in profile. Central process of synsternite (6+7) (Fig. 112) with long divergent arms, their tips becoming parallel. Surstylus (Figs 116, 117) slender, only weakly downcurved, in dorsal view very characteristic and differing from all other afrotropical *Anthomyia* species (inner lobe produced and bearing 2 slender spinules, separated from the outer lobe by a deep incision). Cercal plate (Fig. 116) of about equal length and width, with rather long and slender apical spinules and 1–2 pairs of longer setulae on either side of them, otherwise weakly setulose only on basal half, in profile apex not at all projecting, rounded and concealed behind surstylus. Pregonite (Fig. 120) parallel-sided with 2 setulae on distal margin; postgonite (Fig. 120) with an narrow setula (arising on inner surface some distance from the obtuse ventroapical corner. Distal section of aedeagus (Fig. 121) with a robust distally directed dorsal process only slightly separated from its base; its apex abruptly bent, dorsal margin of distal section straight in basal half in lateral view, with apical part abruptly bent upwards.

Female:

Colour: Head dark as in male, palpi sometimes orange basally. Thoracic pattern very similar to that of male, sometimes with base of scutellum narrowly grey dusted. Abdomen with black and grey pattern on abdominal tergites similar to that of male. Legs dark as in male (femora sometimes orange-brown in basal half).

Head: Eyes widely separated (by about their transverse width, ratio 10:9:10); interfrontalia at level of middle orbital setae about four times as wide as each parafrontal; parafrontalia widening anteriorly to about width of first flagellomere; genae below lowest point of eye margin about 0.3 times eye-height. Arista tapering as in male. Parafrontal setae differentiated into 3 pairs of orbital setae (anterior setae normally proclinate, posterior two reclinate) and one pair of (inwardly directed) frontal setae; crossed interfrontal setae well developed, as long and strong as adjacent orbital setae.

Thorax: Presutural acrostichal setulae as in male. Katepisternals 1(2) + 1 (the hair-like anterior ventral setula longer than the fine hair below the posterior setula.

Legs: f2 with 2–3 pv on basal half; f3 with 3–4 short av, without pv; t1 with 1 ad, 1 p; t2 as in ♂, but ad stronger; t3 with 1 av, 5 ad and 2 pd.

Wing length up to 6.5 mm.

Abdomen: Postabdomen (Fig. 94) equal in length to preabdomen. Tergites 6–8 more or less continuously sclerotised across the dorsum posteriorly (where they bear rows of setulae), divided anteriorly into pairs of dorsolateral strips (those on 8th tergite long and narrow, and closer together anteriorly), with a trace of a central strip. 6th and 7th sternites long and narrow, each bearing a few setulae posteriorly (one pair rather long); 8th sternite divided into a pair of elongate strips of sclerotisation, posteriorly with only a pair of long setae. 10th tergite almost as long as wide, bearing about 4 setulae posteriorly; 10th sternite as long as wide, with 4 longer setae on posterior margin; cerci rather short (only as long as 10th tergite) and inwardly directed, with only short setulae. Spermathecae 3, ribbed, longer than wide (0.13 x 0.07 mm).

Discussion: *A. stuckenbergi* can be distinguished from all other African *Anthomyia* species by the cercal plate in lateral view being apically entirely convex, with no upturned or projecting apex. It is closely related to *A. whitei* through the shape of the synsternite (6+7) process, the seta on the postgonite arising from the inner surface, the large ventrally directed membranous lobes on the 5th sternite processes (in lateral view), the long basal setae on the inner margins of the processes of the 5th sternite, and the strong distally directed subbasal dorsal process on the distal section of the aedeagus.

The species may have been overlooked, however, as the general appearance of the fly is not so very different from many other *Anthomyia* species; the undulate posterior margin of the postsutural crossband being similar to species in the *pluvialis* superspecies (those with complete postsutural crossbands)., and *abyssinica*. The latter has plumose arista and a strong costal spine, the former has the dark spot on the vibrissal angle not reaching eye margin.

Distribution: Only known from South Africa (Western Cape and KwaZulu-Natal).

Anthomyia amoena superspecies

♂: Postgonite with widely expanded setula, situated on the ventral margin; inner margins of processes of 5th sternite with only short setulae; posterior margins of 4th sternite straight and without dense setae; central process of synsternite (6+7) minutely pilose. Included afrotropical species are *amoena* (Macquart) and *latilamina* sp. n. Oriental species which belong in this superspecies are: *illocata* Walker, *plumiseta* Stein (probably a synonym of *amoena*), and perhaps the Japanese species *pectoralis* Suwa. The Australian species *vicarians* Schiner, *silvestris* Colless and *medialis* Colless also belong here.

Anthomyia amoena (Macquart, 1851)

(Figs 123–132)

Spilogaster amoenus Macquart, 1851: 261.

Anthomyia amoena: Stein, 1906: 74; Stein, 1908: 173; Bezzi, 1908: 97; Stein, 1910*b*: 160; Stein, 1919: 147; Bezzi, 1923: 80; Bezzi & Lamb, 1926: 565; Emden, 1941*b*: 261; Emden, 1948: 163 (in part); Emden, 1951: 329, 353; Orian, 1962: 25.

Hylemyia fasciata Walker, 1858: 217; Stein, 1906: 73; Stein, 1908: 173; Bezzi, 1908: 96; Speiser, 1910: 159. **Syn. n.**

Spilogaster fasciata: Stein, 1901: 195.

Anthomyia fasciata: Stein, 1913: 562; Stein, 1918: 199; Stein, 1919: 147; Speiser, 1924: 103; Malloch, 1924: 268, 274; Karl, 1935: 47; Emden, 1941*b*: 261; Paterson, 1956: 164; Emden, 1958: 9; Orian, 1962: 25; Peris, 1963: 101; Disney, 1973: 212; Beaver, 1986: 196.

Hylemyia tricolor Bigot, 1885: 301; Stein, 1906: 73; Stein, 1907: 289. Synonymy after Stein, 1906: 73.

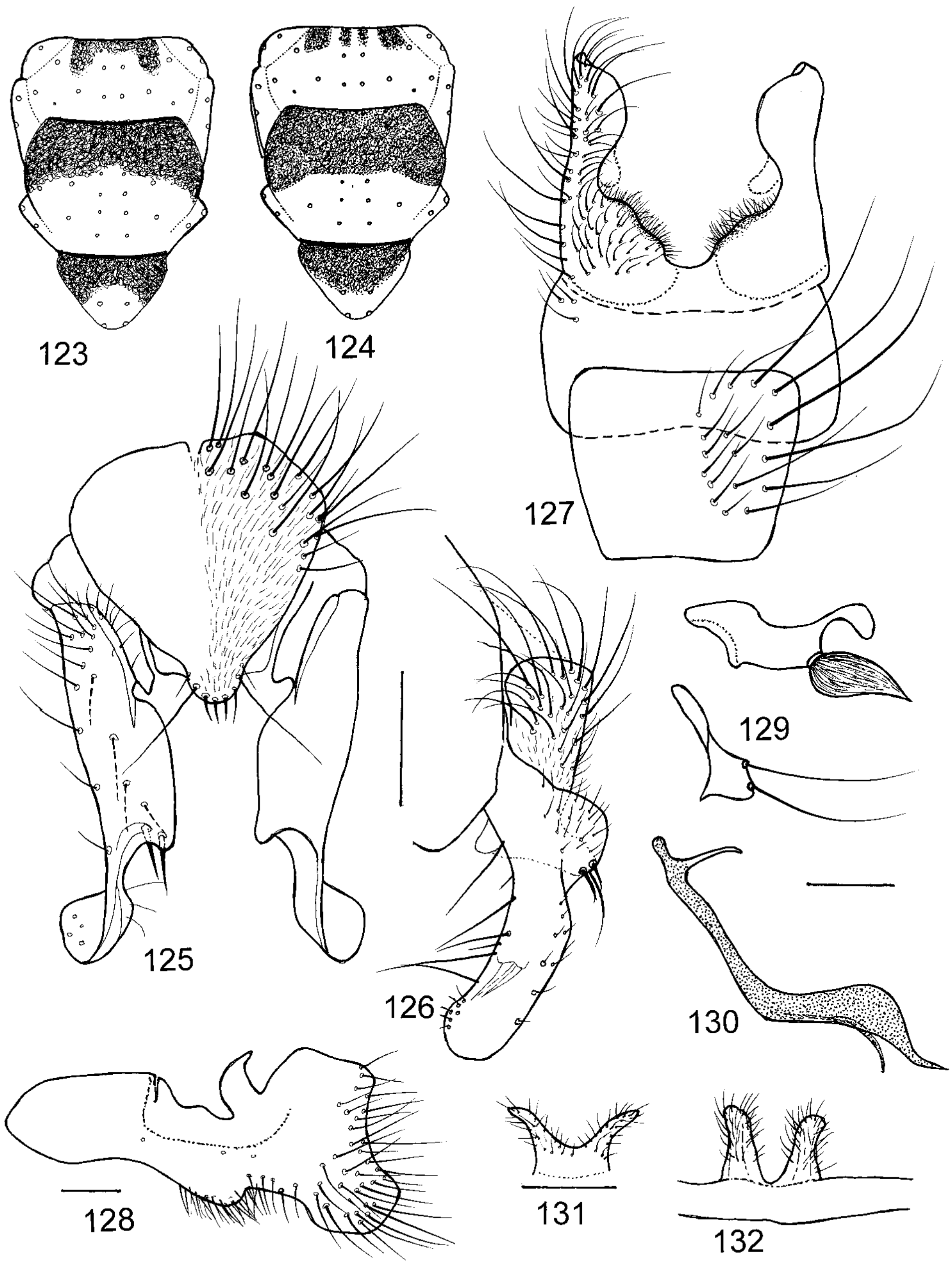
Anthomyia tricolor: Bezzi, 1908: 96; Stein, 1913: 562; Stein, 1919: 147; Pont & Ackland, 1980: 715; Pont, 2000: 28.

Lectotype ♀ of *amoena*: MAURITIUS: '*Spilogaster* / *amoenus* ♀ / Macquart n. sp.' [rectangular white label]; 'Type' [rectangular red label]; '2901.40' [dark green disc; these numbers refer to Mauritius, collector Desjardins]. In Macquart coll. MNHNP No 989, box 27. Lectotype labelled as such by Pont, but not published; this specimen is here designated as lectotype to fix the current taxonomic concept and to ensure its consistent future interpretation. The lectotype has been partly eaten by beetle pests, otherwise in good condition; right anterior pleura, sides and venter of abdomen eaten away; right wing, left fore tibia and tarsus, and all right legs missing. I examined this specimen in 1975, when it was brought to London by the late Dr L. Matile. I am grateful to Dr A. C. Pont for permission to quote from his unpublished MS on Macquart's species, which includes data on the labels, and to make this lectotype designation.

Lectotype ♂ of *tricolor*: SOUTH AFRICA: *KwaZulu-Natal*: standing over the label: '*H. tricolor* ♂ / Port Natal J. Bigot' [rectangular white label with black line border]; on pin: 'Lectotype' [white circular label with purple perimeter]; 'Ost Afrika / Port Natal / Coll. Bigot' [blue rectangular handwritten label]; 'LECTOTYPE ♂ / designated by / A. C. Pont, 1977 / *Hylemyia* / *tricolor* / Bigot' [white square printed and handwritten label with red line border]; '*H. tricolor* / EX COL. BIGOT' [white printed and handwritten label]. It is rather damp, left mid tibia and tarsus, and right hind tarsal segments 4–5 missing, otherwise in fair condition. The lectotype designation was effectuated by Pont 2000: 228. In UMO, revised during present study.

Holotype ♂ of *fasciata*: SOUTH AFRICA: *KwaZulu-Natal*: 'Holotype' [circular white label with red perimeter]; 'Natal' [white rectangular handwritten label]; '*fasciata* Wkl.' [white rectangular handwritten label]; 'HOLOTYPE ♂ / *Hylemyia* / *fasciata* Walker / 1853, Trans. ent. Soc. Lond. (2)4: 21' [white rectangular handwritten label with red border]. In reasonable condition, head damaged on one side. In BMNH, revised during present study.

Other material examined: ANGOLA: 1♂, (A37), 5 mls NE Negola, 25.iii.1972, Southern African Exp., 1972 (BMNH); 1♂, (A41), Joao de Almeida, 29.iii.1972, Southern African Exp., 1972 (BMNH); 2♀, Bruco, 26.ii–2 iii.1972, Southern African Exp., 1972 (BMNH). BOTSWANA: 1♀, Kenye, i.1956, F. Zumpt (BMNH); 1♀, Mabebe Plate, 7.x.1958, F. Zumpt (BMNH); 2♀, B11, Moremi Reserve, 19°23'S:23°33'E, 18–20.iv.1972, Southern African Exp., 1972 (BMNH); 3♂1♀, (B8), L. Ngami, 2 mls NE Sehitha, 15–16.iv.1972, Southern African Exp., 1972 (BMNH). CAMEROON: 2♂5♀, Kumba, vi.1970, R. H. L. Disney (BMNH). CAPE VERDE ISLANDS: 1♂1♀, Nicolau, Mte. Gordo, 9–15.xii.1953, Panelius (BMNH). DEMOCRATIC REPUBLIC OF CONGO: 2♂, Albertville, 1.ix.1931, Prof. J. D. A. Cockerell (BMNH). GHANA: 4♂1♀, [no locality], 1910, W. P. Lowe (BMNH); 1♀, Aburi, 1912–13, W. H. Patterson (BMNH); 1♂1♀, [on same mount], Kumasi, 16.viii [illegible year], JB (BMNH); 1♂, Accra, iii.1920, Dr J. W. S. Macfie, laboratory (BMNH); 3♂, same data but iii.1921; 2♀, same data but 1922; 1♂3♀, Yapi, 1–4.vi.1916, Dr J. J. Simpson (BMNH); 1♀, Accra, x–xi.1921, Dr A. Ingram (BMNH); 3♀, Ashanti, Obuasi, 12.vi.1907, Dr M. W. Graham (BMNH). IVORY COAST: 1♀, Comoé Nat. Park, Kakpin Camp, 08°40'N:03°12'W, 16–18.iv.1989, J. G. H. Londt, Malaise & savanna woodland (NMSA). MALAWI: 1♂, Naiwale, 28.xii.1928, Dr W. A. Lamborn (BMNH); 1♂, Zomba, [no date], H. S. Stannus (BMNH). MAURITIUS: 1♂, Curepipe, 3.vi.1971, A. M. Hutson (BMNH); 1♂2♀, Round Is., summer, 1975 (BMNH); 1♀, Black River, 17.vi.1971, A. M. Hutson (BMNH). MOZAMBIQUE: 1♂, Luabo, i.1956, P. Usher (BMNH); 2♂, same data, (NMSA); 1♀, Laurenco Marques, 11.iii.1953, F. Zumpt (BMNH); 1♀, same locality, 1909, J. de O. S. de Azevedo (BMNH); 1♂, Lumbo, 1.ix.1918, A. Loveridge (BMNH); NAMIBIA: 1♂, Rundu dist., Simanya Okavanga River, 17°33'17"S:18°32'30"E, 23–24.i.1998, A. H. Kirk-Spriggs & E. Marais, Malaise traps, riverine forest (NMWN); 2♀, Katara Okavanga R., 17°48'56"S:18°53'38"E, 20–23.i.1998, A. H. Kirk-Spriggs & E. Marais, Malaise traps (NMWN); 1♀, 20 km E Rundu, 17°55'46"S:19°58'43E, 17–18.x.1999, Kirk-Spriggs & Pape Hauwanga, Malaise trap sample (NMWN); 1♀, Opuwa dist., Ekuje village, Kuneme River, 17°19'30"S:13°48'58"E, 11–12.x.1999, Kirk-Spriggs & Pape Hauwanga, (NMWN); 1♀, NW Epembe at: 17°26'27"S:13°17'31"E, 8.x.1999, Kirk-Spriggs & Pape Hauwanga, Malaise traps river bed (NMWN); 1♂2♀, Otavi dist., Algamas, 471, 19°28'S:17°17'E, 1–2.xi.1985, J. Irish (NMWN); 1♂2♀, Tsumeb dist., Gaub, 47, 19°28'S:17°00'E, 16–26.vii.1986, J. Irish, Malaise trapping (NMWN); 1♂, (W39), Kombat, 16–17.ii.1972, Southern African Exp., 1972 (BMNH); 1♂, (10), Plateau Fm., 22 mls E Aus, 14–17.i.1972, Southern African Exp., 1972 (BMNH); 1♂1♀, (29), Kahn River, 5 mls N Usakos, 30–31.i.1972 (Southern African Exp. BM) (BMNH); 1♀, (W50), Gobiswater Fm, 12 mls N Grootfontein, 5.iv.1972, Southern African Exp., 1972 (BMNH). NIGERIA: 1♂, Samaru, 1–2.vi.1970, P. H. Ward, mercury vapour light trap (BMNH); 1♀, same locality but 3–10.vi.1970 (BMNH); 1♂, NW State, Mokwa, I. A. R. mile 4, 17–19.viii.1970, P. H. Ward (BMNH); 1♀, same data but 9.vi.1970, Forestry Res. Centre (BMNH); 1♂1♀, Zaria, Samaru, 21–23.vi.1969, J. C. Deeming, m.v. trap (BMNH); 1♀, same locality but 10.vii.1977 (BMNH); 1♂, Ikoyi, Lagos, 10.ii.1972, M. A. Cornes (BMNH); 1♂, same locality but 16.vii.1956 (BMNH); 1♂1♀, Yaba, 18.v.1913, Dr J. W. Scott-Macfie (BMNH); 1♂, same data but 30.vi.1913 (BMNH); 1♀, Ibadan, 21.vi.1913, Dr W. A. Lamborn (BMNH); 2♂, same data but 15.vii.1913 (BMNH); 2♀, Ile-Ife, 25.xi.1974, J. T. Medler (BMNH); 1♀, Agege, 9.iv.1911, Dr A. Cornell (BMNH). RODRIQUEZ ISLAND: 1♂, viii–xi.1918, H. P. Thomasset & H. J. Snell (BMNH). SEYCHELLES: 1♂1♀, Mahon, ix.1908, Prof. J. S. Gardiner (BMNH); 1♀, Aldabra, ix.1908, J. C. F. Fryer (BMNH). SIERRA LEONE: 1♀, Njala, viii.1934, E. Hargreaves (BMNH); 1♀, Bo, 2.viii.1909, Dr H. E. Arbuckle (BMNH). SOUTH AFRICA: *Northern Province*: 2♂6♀, Kruger Park, Shongile borehole near Letaba, 2331Cd, 9.xii.1972, tree-trunks & water edge (NMSA); 1♀, Letaba Est, iii.1978, S. Kamburov (NMSA); 1♂, River Limpopo, 23°00'S:27°57'E, 25–26.iv.1972, Southern African Exp., 1972 (BMNH); 1♂, Tzaneen, i.1953, F. Zumpt (BMNH); 1♀, same locality but xii.1952, F. Zumpt (BMNH); 1♀, same locality but 14.xii.1931, B. de Meillon (BMNH). *Mpumalanga*: 1♂, Houtbosloop River, near Rivulets, Nelspruit Dist., 2530BC, 6.xi.1970, B. Stuckenberg, gallery forest (NMSA); 2♂, Kruger Park, 2431Db, 20 km NNE of Tsokwane, near road junction S35–37, 5.i.1974, B. & P. Stuckenberg, open savanna (NMSA). *North West*: 1♂, Potgietersrust, 6.xii.1953, F. Zumpt (BMNH). *Gauteng*: 1♂, Meyerton, 25.iii.1974, F. Zumpt (BMNH). *KwaZulu-Natal*: 1♀, Umlalazi Nature Res., SE2831DD, 27–27.i.1987, J. G. H. Londt, dune forest & margin (NMSA); 1♀, #93, Midlands, Howick, 29°29'S:30°13'E, 1060 m, 2.x.1981, A. E. Whittington, pan trapped in grass (NMSA); 8♂, Zululand, Ndumu, xi.1967, F. Zumpt (BMNH); 1♂, same locality, 2632Cc, 26.x.1972, M. E. Irwin (NMSA); 2♂, same locality, Ingwavuma Dist., Tongaland, 1–10.xii.1963, B. Stuckenberg (NMSA); 1♂, 15 km SE Ingwavuma, 2732AA, 21.ii.1979, J. G. H. Londt, sunny area with big trees, ex Malaise trap (NMSA); 7♂2♀, Empangeni, 28°38'S:31°42'E, 5–15.i.1990, Reavell, Malaise trap (NMSA); 2♂, Illovo Beach, 27.ii.1954, F. Zumpt, (BMNH); 1♂, Umhlanga Bush, near Durban, 9.xi.1962, B. & P. Stuckenberg, from coastal forest (NMSA); 1♂, Pietermaritzburg, Montrose in garden, 2930BC, 11.vi.1983, J. G. H. Londt (NMSA); 1♂1♀, Maritzburg, 25.xii.1903, Paulus (NMSA) [♂ on same pin as a specimen of *A. ornata* ♀]; 2♀, Lynnfield Park, 6–8.iv.1989, A. E. Whittington, Malaise trap (NMSA); 1♀, Weenen Nature Reserve, 28°57'S:29°59'E, 1080 m, 1–4.x.1990, A. E. Whittington, Umthombe watertable (NMSA); 1♀, Kosi Bay Nat. Reserve, 2632DD, 30.xi–2.xii.1982, J. Londt, D. Barraclough & B. Stuckenberg, forest & open woodland areas (NMSA); 1♀, Mkuzi Game Reserve, *ca*. 27°35'S:32°13'E, 11.i.1988, J. G. H. Londt, 100 m, main camp & caravan park areas (NMSA). *Eastern Cape*: 1♂1♀, Port St. John's, 19.ii.1954, [illegible] forest, Paterson (BMNH); same locality, x.1916, H. H. Swinny (NMSA); 1♀, same locality but 14.ii.1950 (BMNH). SEYCHELLES: 2♀, Mahe, ix.1908, Prof. J. S. Gardiner (BMNH). SUDAN: 1♀, Delami, NMP, 24.iv.1927, W. Ruffledge, rock shade (BMNH). TANZANIA: 3♂, Zanzibar, Prison Is. 27.xi.1912 (BMNH); 1♂, Makoa, 6–25.ii.1969, E. Lindner (SNMS). UGANDA: 1♂, Entebbe, 5.v.1954, F. Zumpt, nesting [illegible] (BMNH); 1♂, Kampala, 8.xii.1916, C. C. Gowdey (BMNH); 6♂, Kampala, Mulago, 4.ix.1936, E. G. Gibbins, on exuded Eucalyptus sap (BMNH); 1♂, nr Junja, ix.1956, M. C. Williams, from cormorant's and little egret's nest material (BMNH). ZAMBIA: 2♂, Roma Lusaka, 8–11.1976, G. W. H. (BMNH); 1♀, same locality but 22.xii.1974 (BMNH); 1♀, same locality but 7.i.1976 (BMNH); 1♀, Lusaka, 20.ii.1979, R. A. Beaver, bred from old snail (BMNH); 1♂, same locality, 1.xii.1979, G. W. Howard (BMNH). ZIMBABWE: 1♂1♀, Gatooma, xii.1927, A. Cuthbertson (BMNH).



Figs 123–132. *Anthomyia amoena* (Macquart). ♂. 123. Thorax, dorsal view (Mauritius). 124. Ditto (Tanzania, Makoa). 125. Cercal plate and surstyli, caudal view. 126. Ditto, lateral view. 127. 4th and 5th sternites, ventral view. 128. 5th sternite, lateral view. 129. Gonites. 130. Distal section of aedeagus. 131. Central process of synsternite (6+7). 132. Ditto (Makoa).

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to blackish (with rather dense silvery dusting); parafrontals opposite lunule with a greyish shifting sheen stripe which extends from lunule to level of arista, and a blackish brown non-shifting spot in vibrissal angle which does not extend above genal groove when viewed in profile; face and occiput blackish (with normal dusting), except upper part of occiput greyish dusted. Antennae entirely dark brown to blackish. Palpi dark brown to black; arista paler basally; prementum dark brown, thinly dusted. Thorax (Figs 123, 124) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface; transverse postsutural band across the scutum complete between wing bases (anterior and posterior margins more or less straight, the latter just reaching 2nd postsutural dorsocentral setae); presutural spots generally joined behind head, forming a rectangular spot which is indented medially on posterior margin, and only reaches 1st presutural dorsocentral setae (sometimes this presutural mark is divided by narrow grey dusted vittae, and in some specimens the spots are not joined but remain separate); scutellum black on basal two-thirds, with silvery grey tip extending along lateral margins (occasionally scutellum entirely dark). Pleura largely grey dusted, only lower part of the post pronotal lobes brownish black. Abdomen largely densely dusted over dark to orange ground-colour (basal tergites often orange-yellow and rather translucent depending on angle of vision), with contrasting black and grey pattern on tergites (black central vitta on 3rd and 4th tergite nearly as wide as hind femur (anteriorly wider and joined to a narrow black band which expands into a smallish triangular spot laterally); pregenital sclerite contrastingly shining brownish black (undusted); sternites yellowish, hypopygium and 5th sternite rather finely dusted. Wing membrane slightly brownish grey tinged, with orange-brown veins; squamae whitish with whitish fringes; halteres yellow. Legs entirely dark brown to orange.

Head: Parafrontalia very narrow posteriorly (touching for about half length of frons), widening anteriorly to about width of first flagellomere, parafacials rather narrow, two-thirds width of first flagellomere; eyes separated by less than width of anterior ocellus, frontal stripe very narrow above lunule, about 1.5 times diameter of anterior ocellus; genae setae below lowest point of eye margin 0.25–0.26 times eye-height. 2 pairs of short parafrontal setae on anterior third of distance between antennal base and anterior ocellus; interfrontal setulae apparently absent. First flagellomere rather narrow, nearly 3.4 times as long as wide, (apex not quite reaching lower facial margin); arista tapering from base to apex (not abruptly narrowing in distal two-thirds), short plumose, total width of hairing from slightly less to more than width of first flagellomere. Prementum about 0.4 times as long as head height.

Thorax: 3 pairs of presutural acrostichals (the middle pair slightly stronger, and placed closer to anterior pair than to posterior pair) in rows separated by about distance from each to adjacent dorsocentral row, without additional setulae in between (occasionally an isolated setulose hair present); acr / dc ratio 1:1:1; posthumerals1 + 1; prealar of same length as posterior notopleural; dorsal surface of scutellum bare centrally; katepisternals 2 + 2, lower posterior nearly as long as upper anterior seta, lower anterior half length of upper anterior; anepisternum with a developed upper anterior setula.

Legs: f2 with row of 3–4 pv on about basal third; f3 with 7–8 av in distal half; t1 with 1 median pv; t2 without ad, 1–2 pd and 2p/pv; t3 with 1 av, 5–6 ad, 2 pd and 3–4 pv.

Wing: costa with all marginal spinules short; the pair before distal break not or hardly differentiated; lower cross-vein sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.4 times length of preceding section. Lower squama as long as upper.

Wing length up to 5.0 mm.

Abdomen: Long ovate and rather short (1.5–1.7 times as long as wide), widest at 3rd tergite; dorsoventrally semi-compressed in basal two-thirds. 4th sternite (Fig. 127) about as long as wide, with a straight posterior margin, only lateral margins with long setae. 5th sternite processes (Figs 127, 128) with quite numerous setae laterally along whole length, otherwise with only short setulae on convex inner margins of processes (which are densely pilose); membranous lobes (Fig. 128) hardly projecting ventrally in lateral view, the apical setulae short. Central process of synsternite (6+7) (Figs 131, 132) with divergent or parallel arms, which are pilose. Surstylus weakly downcurved, apical half equally wide in lateral view, in profile upper dorsal margin with a well developed lobe. Cercal plate (Fig. 125) of about equal length and width, with a few short apical spinules and 1 pair of longer setulae on either side of them, otherwise setulose only on basal half, in profile apex weakly projecting, concealed behind surstylus. Pregonite small and short, not longer than wide (Fig. 129), with 2 normal setulae on distal margin, postgonite (Fig. 129) with an expanded setula on posterior ventral corner. Distal section of aedeagus (Fig. 130) long and slender, with a proclinate dorsal process slightly separated from its base, dorsal margin of distal section straight in lateral view, then abruptly flexed in distal half.

Female:

Colour: Head dark as in male. Thoracic pattern very similar to that of male. Abdomen with black and grey pattern on abdominal tergites similar to that of male (with central black marks often triangular (wide basally). Legs dark or orange as in male.

Head: Eyes widely separated (by slightly more than their transverse width, ratio 5:4:5); interfrontalia at level of middle orbitals about twice as wide as each parafrontal; frontal stripe narrowed anteriorly; parafrontalia widening anteriorly to about width of first flagellomere; genae below lowest point of eye margin about 0.27 times eye-height. Arista as in male (often with longer hairing). Parafrontal setae differentiated into 3 pairs of orbital setae (anterior setae normally proclinate, posterior two reclinate) + 2 pairs of (inwardly directed) frontal setae; crossed interfrontal setae well developed, their tips reaching margins of frontal stripe.

Thorax: Presutural acrostichal setulae slightly stronger than in male. Katepisternals 2 + 2, both lower setae about half length of upper setae. Dusted frontal triangle with a rounded anterior margin.

Legs: f2 with 1 av and 2 pv on basal half; f3 with 5 av (shorter basally), and 1 preapical pv; t1 with 1 p; t2 with 1 ad, 2 pd and 2 p/pv; t3 with 1 av, 4–5 ad and 2 pd.

Wing length up to 5.0 mm.

Abdomen: Postabdomen equal in length to preabdomen. The ovipositor does not differ significantly from that of *A .benguellae*.

Discussion: Stein (1901) studied the type of *fasciata* Walker. In 1906 he synonymised *Hylemyia tricolor* Bigot with *Hylemyia fasciata* Walker. In 1907 he revised the non-

European species of Anthomyiidae described by Bigot and Macquart, but did not include *amoena*. In 1908 he included both *Anthomyia amoena* and *fasciata* in a list of African *Anthomyia*. In 1910 he recorded *Anthomyia amoena* (Macq.) from the Seychelles, Aldabra and Madagascar. In 1913 he listed *fasciata* from several localities in South Africa. He commented that Macquart's *amoena* was not identifiable without examination of the type (obviously not possible for him in 1913), but that it only differed (according to the description or specimens he identified as *amoena*) from *fasciata* through a completely whitish grey, not weakly reddish abdomen. In 1919 he catalogued them as separate species of *Anthomyia*.

Neither Malloch (1924) nor Karl (1935) mentioned *amoena*. Emden (1941*b*) keyed out *fasciata* and *amoena* on colour characters of the abdomen and scutellum.

In 1951 Emden recorded *amoena* from Uganda, Mauritius, Seychelles, Mozambique and Yemen. The male from Yemen (labelled W. Aden Prot., Jebel Jihaf, *ca*. 7,100 ft, ix.1937, H. Scott and E. B. Britton) and the male from Uganda (Mbarara, 15.x.1934, F. W. Edwards), both of which carry a det label '*amoena* det. v. Emden, 1940' are not *amoena* but *subabyssinica* sp. n. (genitalia examined).

I can find no significant differences in the genitalia of specimens of *amoena* from widely separate localities. There are small colour differences in the dark pattern of thorax and scutellum, and in colour of abdomen, but these are not correlated with any slight differences in the genitalia details which occur in allopatric populations and island faunas.

Distribution: *A. amoena* is a common and widely distributed species from the Cape Verde Islands in the west, the whole of Africa south of the Sudan and Nigeria, and the Indian Ocean islands.

Anthomyia latilamina sp. n.

(Figs 133–141)

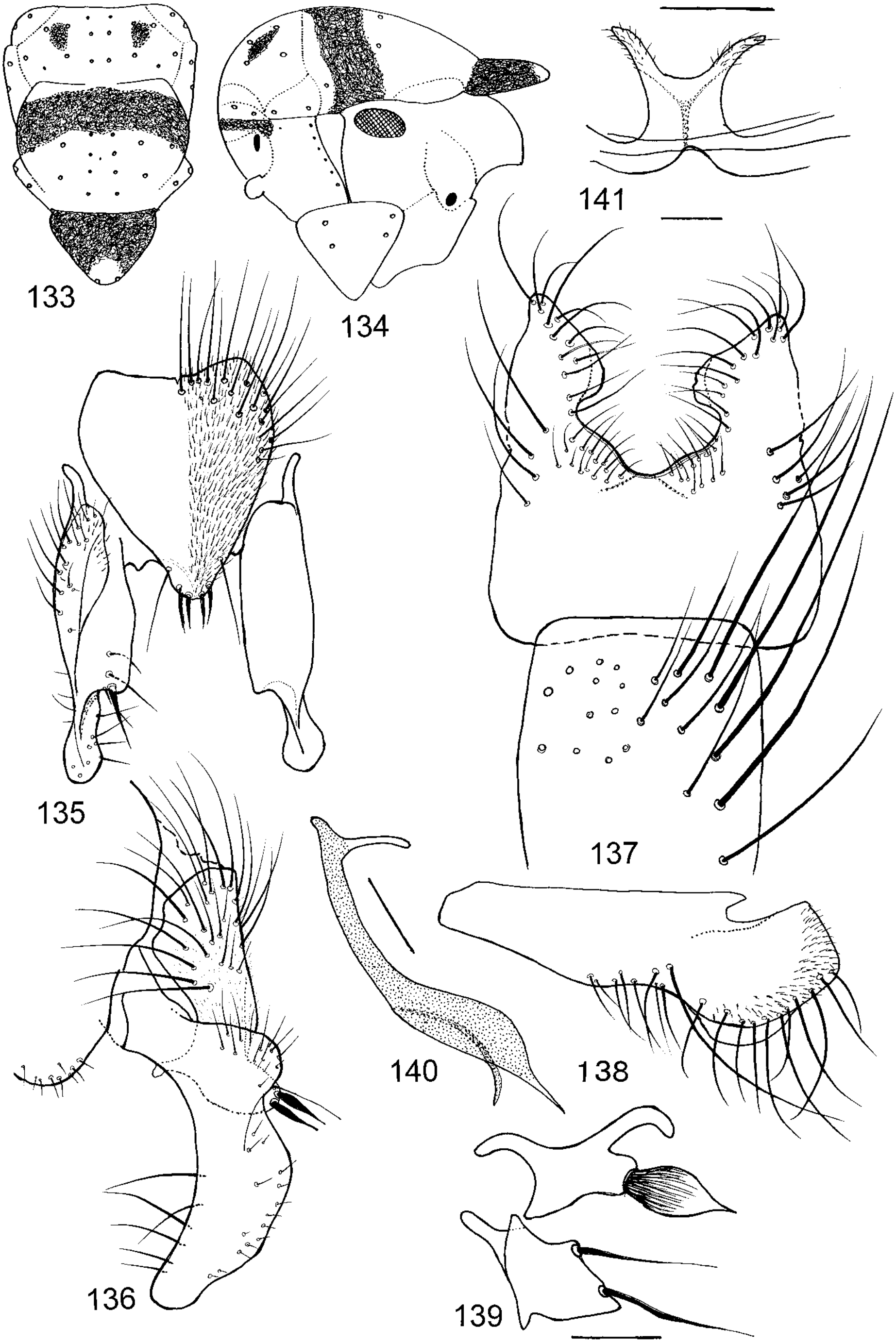
Holotype ♂: KENYA: 'Holotype' [circular printed white label with red perimeter]; 'Nanyuki, Ka [=Kenya] / de Bruin (1) / 14 Jan 59 / em 21 Jan' [white rectangular handwritten in pencil label]; 'SOUTH AFRICA [*sic*]: / pres. by F. Zumpt / BM 1976–209' [rectangular white printed label]; 'HOLOTYPE / *Anthomyia* ♂ / *latilamina* / D. M. Ackland' [red rectangular printed and handwritten label]. In good condition. Genitalia dissected and mounted in water-soluble DMHF resin on card, on staging pin. In BMNH. The label 'South Africa' was a general label applied to material presented to the Natural History Museum by Zumpt; de Bruin bred several species of *Anthomyia* from bird nests in East Africa, and sent them to Zumpt. As the paratype is labelled 'em. bird's nest' it is safe to assume that the holotype did likewise.

Paratype ♂: UGANDA: Lodwar, 10.ii.1959, em. [emerged] 14.ii., bird nest (BMNH). [FIGS 133–141]

Etymology: From the L. *latus* =wide, and L. *lamina* =blade, a reference to the wide surstyli.

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to blackish (with rather dense silvery dusting); parafrontals opposite lunule with a brownish orange



Figs 133–141. *Anthomyia latilamina* sp. n. ♂ holotype. 133. Thorax, dorsal view. 134. Ditto, lateral view. 135–141. Terminalia. 135. Cercal plate and surstyli, caudal view. 136. Ditto, lateral view. 137. 4th (part) and 5th sternites, ventral view. 138. 5th sternite, lateral view. 139. Gonites. 140. Distal section of aedeagus. 141. Central process of synsternite (6+7).

shifting sheen stripe which extends from lunule to level of arista, and a brownish orange partly non-shifting spot in vibrissal angle which extends above genal groove when viewed in profile; face and occiput blackish (with normal dusting), upper part of occiput greyish dusted. Antennae dark brown, pedicel light brownish apically. Palpi dark brown, orange apically; arista paler in middle; prementum dark brown, thinly greyish dusted medially. Thorax (Figs 133, 134) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface; transverse postsutural band across the scutum complete between wing bases (anterior and posterior margins irregularly indented, the anterior margin not reaching suture, posterior margin reaching 2nd postsutural dorsocentral setae); presutural spots small, each spot hardly filling the space between presutural dorsocentrals and anterior posthumeral setae (and not reaching posterior posthumeral seta); scutellum largely black, with only its tip silvery grey. Pleura largely grey dusted, only lower part of the post pronotal lobes and anterior corner of anepisternum brownish black. Abdomen largely densely dusted over orange ground-colour, with contrasting black and grey pattern on tergites. Wing membrane slightly brownish orange tinged; veins orange-brown, except stem vein and membrane basally which are whitish; squamae as pale as wing base with whitish fringes; halteres yellow. Legs dark brown with grey dust (trochanters and femora partly orange).

Head: Parafrontalia 1.5 times width of anterior ocellus, not quite touching posteriorly (separated by narrow frontal stripe which is about half width of anterior ocellus), widening anteriorly to about width of first flagellomere; eyes at narrowest point separated by 3 times width of anterior ocellus; genae below lowest point of eye margin 0.32–0.34 times eye-height. 2 pairs of parafrontal setae on anterior half of distance between antennal base and anterior ocellus (anterior pair very small); minute interfrontal setulae. First flagellomere 2.5 times as long as wide (apex not reaching lower facial margin); arista tapering from base to apex (not abruptly narrowing in distal two-thirds), nearly twice length of first flagellomere, very short pubescent, longest hairs not as long as diameter of base. Prementum about 0.25–0.3 times as long as head height.

Thorax: 3 pairs of presutural acrostichals (the middle the longest) in rows separated by about distance from each to adjacent dorsocentral row, without additional setulae in between; acr / dc ratio 1:1:1; posthumerals1 + 1; prealar of same length or slightly longer than posterior notopleural; dorsal surface of scutellum bare centrally, lateral setulae (on sides) rather long; katepisternals 2 + 2, lower posterior as long as upper posterior seta, lower anterior half length of upper; anepisternum without a developed upper anterior setula, at most a slightly longer hair present.

Legs: f2 with row of 3 pv on about basal half; f3 with 7–9 av on whole length; t1 with a short ad and a longer median 1 pv; t2 with 1 ad, 2 pd and 2 p/pv; t3 with 1 av, 5 ad, 3 pd and 3–5pv.

Wing: costa with all marginal spinules short; the pair before distal break hardly differentiated, about 1.5 times length of adjacent spinules; lower crossvein slightly sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.5 times length of preceding section. Lower squama smaller than upper.

Wing length up to 6.5 mm.

Abdomen: 4th sternite (Fig. 137) about twice as long as wide (wider than half width of 5th sternite), with a straight posterior margin, with long lateral setae. 5th sternite processes

(Figs 137, 138) short, with a few short setae laterally at their bases, otherwise with short bi-triserial rows of setulose hairs on their concave inner margins which are continuous with the apical setulae; membranous lobes hardly projecting ventrally in lateral view. Central process of synsternite (6+7) (Fig. 141) with divergent arms in apical half only, tips of arms minutely pilose. Surstylus (Fig. 136) slightly downcurved, very wide medially in lateral view, tapering to a rather narrow apex, bearing a ventral row of rather long setulae and 2 short spinules below the angle of its inner lobe; in profile upper dorsal margin with a moderately well developed lobe. Cercal plate (Fig. 135) of about equal length and width, with a few short apical spinules and 1 pair of longer setulae on either side of them, otherwise setulose only on basal half, in profile apex not projecting, concealed behind surstylus. Pregonite (Fig. 139) short and wide, with 2 setulae on the oblique distal margin; postgonite (Fig. 139) with an widely expanded setula (extension beyond setula very narrow, and deeply indented just beyond setula). Distal section of aedeagus (Fig. 140) with a proclinate dorsal process separated from its base by half its length, dorsal margin of distal section concave in lateral view, with the forked tips of its dorsal sclerotization projecting beyond the downcurved acrophallic sclerite.

Female unknown.

Discussion: *A. latilamina* is a distinctive species; one might mention the narrow postsutural crossband, the wide surstyli, the widely expanded seta on the postgonite (with a narrow dorsal extension), the narrow subbasal dorsal process on the distal section of the aedeagus, and the characteristic shape of the 5th sternite (ventral view). Its close relationship with *amoena* is indicated by the oblique and finely setulose inner margins of the 5th sternite processes (but not finely pilose as in *amoena*), the wide 4th sternite, and the finely but sparsely pilose arms of the process on sternite (6+7).

Distribution: Only known from the type material from Kenya and Uganda.

Anthomyia abyssinica superspecies

Whether this grouping has any validity is unclear. It consists of the remaining afrotropical species, some of which are difficult to identify (especially without resort to dissection of the male genitalia) They all have the setula on the ventral margin of the postgonite slender and situated on the margin, and the postgonite is of similar shape. In most of the species included here, the membranous lobe on the processes of the 5th sternite is small or very small. *A. abyssinica* has a plumose arista and long costal spine(s) and spinules on the wing costa; while *singularis* has a very distinctive black and white scutal pattern in both sexes. I include in this superspecies *abyssinica* Jaennicke, *singularis* (Stein), *malagasica* sp. n., *subabyssinica* sp. n., *acutula* sp. n., and *subornata* sp. n.

Anthomyia abyssinica Jaennicke, 1867

(Figs 142–161)

Anthomyia abyssinica Jaennicke, 1867: 372; Stein, 1919: 147.

Hylemyia abyssinica: Stein, 1902: 134; Bezzi, 1908: 96; Stein, 1913: 554; Stein, 1914: 134; Speiser, 1924: 103.

Anthomyia spinigera Malloch, 1924: 270; Emden, 1941*a*: 213; Emden, 1941*b*: 260; Emden, 1951: 352; Emden, 1956: 529. **Syn. n.**

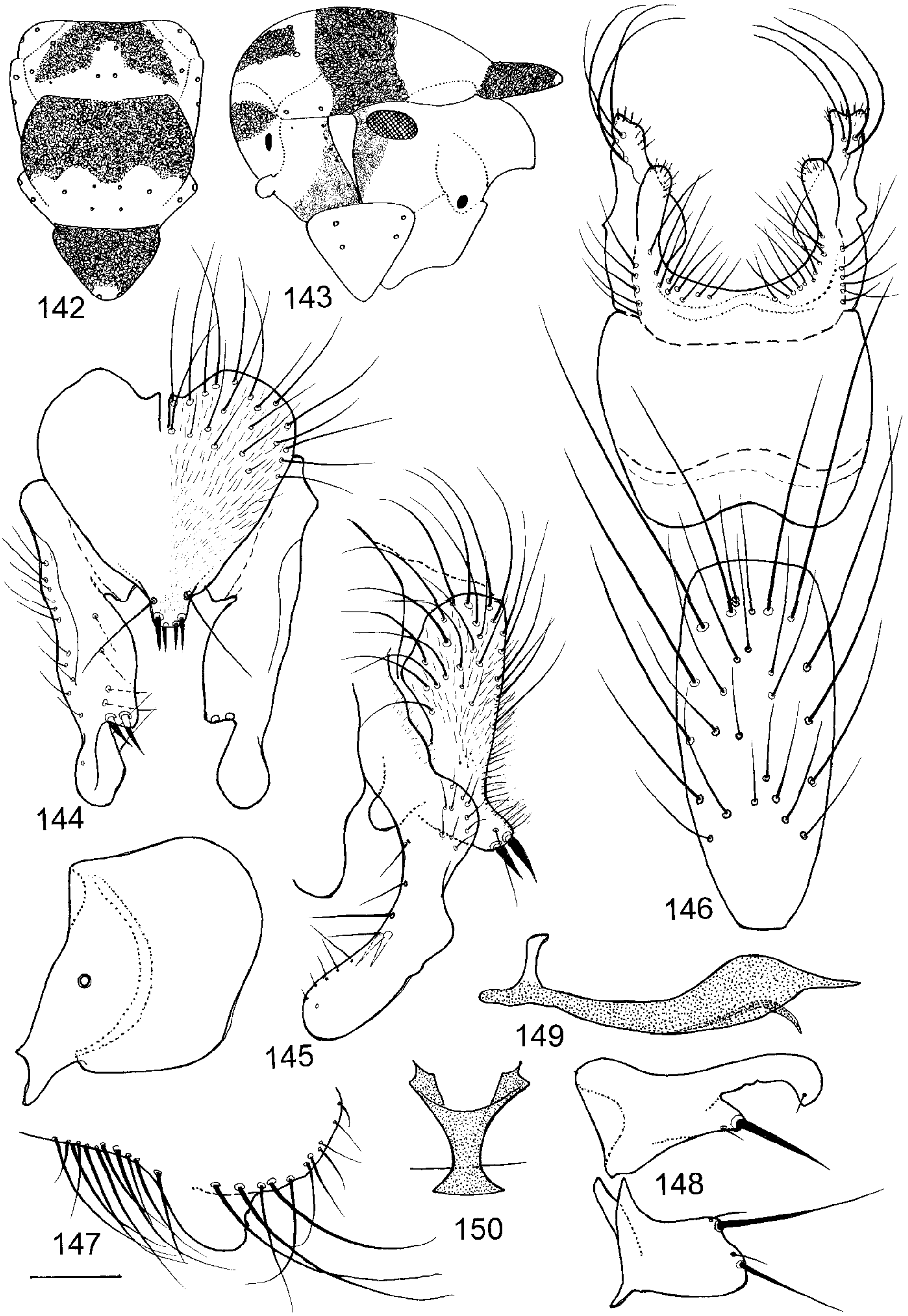
Holotype ♀ of *abyssinica*: ETHIOPIA: ‘Abyssinia / Dr Rüppel’ [white rectangular label]; ‘Typus’ [red rectangular label]; ‘♀ HOLOTYPE / *Anthomyia* / *abyssinica*

Jaennicke / 1867 / det. V. Michelsen 1981' [red rectangular label]; '=gen *Hylemyia* ♀ / ex Stein' [white rectangular label]. In rather poor condition, right wing, left fore leg and both hind legs missing; remaining legs gummed together. In FSF. Reviewed during present study.

Holotype ♂ of *spinigera*: KENYA: 'Holotype' [circular white label with red perimeter]; 'Brit. E. Africa / Kikuyu Escarp / Kijabe / 7–8000 ft. / 28.vii.1911–5.i.1912 / Dr W. Radford / Bamboo forest' [white rectangular handwritten label]; 'Pres by / Imp. Bur. Ent. / Brit. Mus. / 1924–242' [white printed rectangular label]; '*Anthomyia* / *spinigera* / Det / J. R. Malloch Type' [rectangular handwritten and printed label with black line border]. In reasonable condition, both hind legs missing. In BMNH.

Paratypes of *spinigera*: KENYA: 2♂, same data as holotype; 1♀, Njoro, 16.i.1912, T. J. Anderson; 2♀, Kabele, 28.viii.1914, T. J. Anderson, on window; 1♂, Noukuru, i.1913, Dr B. L. van Someren. In BMNH.

Other material examined: DEMOCRATIC REPUBLIC OF CONGO: 1♀, Tshibinda, 21–27.viii.1931, J. Ogilvie (BMNH); 1♂, same locality, 21–27.viii.1931, Prof. T. D. A. Cockerell (det. *Anthomyia griseobasis* Mall. by Emden, 1940) (BMNH). ETHIOPIA: 1♀, Addis Ababa, I. C. L. R. I., 16.x.1968, R. Kano & T. Ohse, 2700m (DMA); 1♀, same locality, Entotto, 17.x.1968, 3000 m, R. Kano & T. Ohse (DMA); 4♂, Mt. Zuquala, 9000 ft, 21–25.x.1926, Dr H. Scott (BMNH); 1♀, Djem-Djem Forest, 9000 ft 24.ix.1926, Dr H. Scott (BMNH). KENYA: 1♀, Kabete, 18–24.xi.1925, G. B. Purvis, in house (BMNH); 2♂5♀, Nyeri, iii.–iv. 1948, M. Steele (BMNH); 2♂1♀, same locality, x.1948, van Someren (BMNH); 10♂5♀, Muguga, viii–x.1969, C. F. Dewhurst (BMNH); 1♂1♀, Nairobi, 9–13.xii.1970, A. E. Stubbs, 5500 ft (BMNH); 1♂, same locality, vii.1930, van Someren (BMNH); 1♂, Sigona, Thitu Farm, 11.iv.1983, K. A. Spencer (BMNH); 2♀, Nairobi River, nr National Museum, 6.i.1972, C. F. Huggins, 5500 ft (BMNH); 1♂1♀, Meru, 24–29.xii.1970, A. E. Stubbs, 5–700 ft (BMNH); 3♂4♀, same locality, vii.1943, van Someren (BMNH); 1♂, Naivasha, ix.1939, H. J. Turner (BMNH); 3♀, same locality, vii.1937, H. J. Turner (BMNH); 3♂, Ngong, ix.1925, van Someren (BMNH); 2♀, same locality, i.1954, van Someren (BMNH); 2♀, Nanyuki, v.1948, van Someren (BMNH); 1♂1♀, Teita Hills, viii.1947, van Someren (BMNH); 2♂, Ruiru, nr. Nairobi, 12.i.1969, at light, M. C. Birch (DMA); 1♂, Nairobi, National Museum, 11.viii. 1989, J. W. Ismay (DMA). MALAWI: 1♀, Zomba Plateau, iv.1957, N. H. L. Krauss (BMNH); 2♀, Viphia, Chikangawa, SE 1133DD, 27.ii.–1.iii.1987, J. & A. Londt, grassland & forest margins (NMSA). NIGERIA: 1♂, Obudu Plat., cattle ranch, 28.iv.1972, J. L. Musa, vegetable garden (BMNH); 3♀, same locality, 21.iii.1971, J. T. Medler (BMNH); 1♀, Ogoja, 27.iv.1972, J. L. Musa (BMNH). SOUTH AFRICA: *Northern Province*: 1♀, Shilouvane, Ztb. Distr., x.1901, Rev. H. A. Junod (NMSA). *KwaZulu-Natal*: 1♀, Giants Castle Res., Drakensberg, 18–23.ix.1963, B. & P. Stuckenberg (NMSA); 3♀, Giants Castle game res., Injamuti area, SE 2929AB, 5–11.xii.1983, J. G. H. Londt (NMSA); 1♀, Drakensberg, Kamberg, 28.xi.1986, A. E. Whittington (NMSA). SUDAN: 1♂, Imatong Mts., 11.xii.1933, Miss M. Steele (BMNH). TANZANIA: 1♂8♀, W Kilimandjaro, Ngare-Nairobi, 4–5000 ft, ii–iii.1937, B. Cooper (BMNH). UGANDA: 1♀, Kigezi Prov., Mabungo, xi.1934, 6000 ft, J. Ford, B. M. E. Afr. Exp. (BMNH); 4♀, Kigeri Dist., Kanaba Gap, 7500 ft, 19.xi.1934, F. W. Edwards (BMNH); 1♀, no locality, 1918, C. C. Gowdey (BMNH); 1♀, Kampala, 8.ix.1911 (BMNH); 1♂, Unyoro, Hoima, 3700 ft., Kittenbergen (DMA).



Figs 142–150. *Anthomyia abyssinica* Jaennicke. ♂ (Kenya). 142. Thorax, dorsal view. 143. Ditto, lateral view. 144–150. Terminalia. 144. Cercal plate and surstyli, caudal view. 145. Ditto, lateral view. 146. 4th and 5th sternites, ventral view. 147. 5th sternite, lateral view. 148. Gonites. 149. Distal section of aedeagus. 150. Central process of synsternite (6+7).

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to blackish (with rather dense silvery dusting); parafrontals opposite lunule with a dark shifting sheen stripe which extends from level of anterior frontal seta to level of arista (only shifting to silvery grey dusting in extreme dorsal view), and a wide blackish non-shifting spot in vibrissal angle which extends above genal groove and reaches eye margin when viewed in profile; face and occiput blackish (with normal dusting), except upper part of occiput greyish. Antennae entirely dark brown. Palpi dark brown to black; arista light brownish in basal half; prementum dark brown, thinly dusted. Thorax (Figs 142, 143) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface; a wide transverse postsutural band across the scutum complete between wing bases (but posterior margin weakly indented around 3rd postsutural dorsocentral seta (with grey dusting around base of latter); presutural spots joined behind head, each spot laterally and posteriorly with a straight border, forming a V shape (inner margins extending towards the presutural acrostichal setulae, posterior margin past level of 2nd presutural dorsocentrals); scutellum almost entirely black (with only its extreme tip silvery grey). Pleura grey dusted, lower part of the post pronotal lobes and anterior and posterior part of anepisternum brownish black. Abdomen largely densely dusted over dark ground-colour (occasionally reddish or orange in parts), with contrasting black and grey pattern on tergites; black central vitta on 3rd and 4th tergite as wide as depth of femur, joined anteriorly to a black crossband on each tergite (about one-third length of tergite) and expands laterally to about half length of tergite; hypopygium and 5th sternite rather finely dusted. Wing membrane slightly brownish orange tinged; wing bases with pale brownish veins; squamae paler than wing base with whitish fringes; halteres yellow. Legs entirely dark brown to orange-red (except for the partly shining trochanters which are sometimes orange-brown).

Head: Parafrontalia very narrow posteriorly (touching for a distance equal to twice diameter of anterior ocellus), widening anteriorly to about width of first flagellomere; parafacial not quite as wide as first flagellomere; genae below lowest point of eye margin 0.26 times eye-height. 2 pairs of parafrontal setae on anterior half of distance between antennal base and anterior ocellus; short but distinct interfrontal setulae present; genal setae in more or less single row anteriorly. First flagellomere twice as long as wide (apex not quite reaching lower facial margin); arista (Figs 151–154, 159) plumose, total width of hairing three-quarters to fully equal to width of first flagellomere. Prementum about 0.4 times as long as head height.

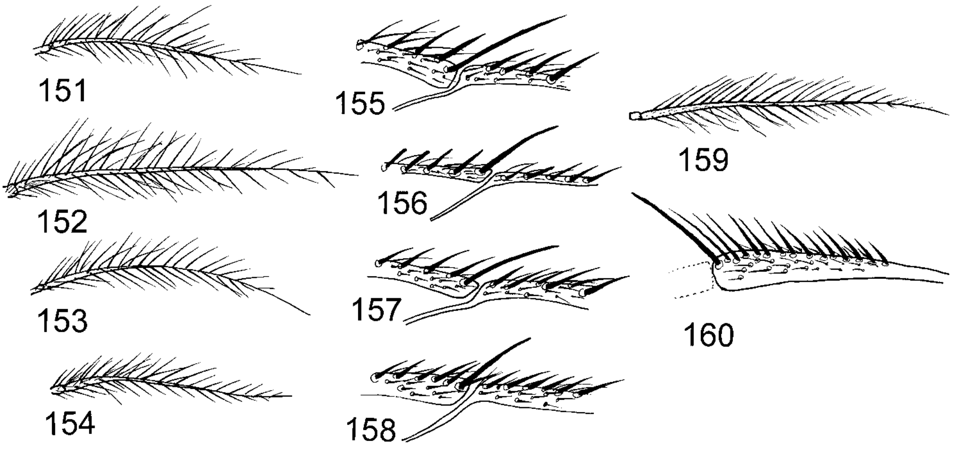
Thorax: scutal setae long, especially dorsocentrals and postalars, and scutellar setae. 3–4 pairs of presutural acrostichals (the middle the longest) in rows separated by about distance from each to adjacent dorsocentral row (sometimes slightly more), generally with additional setulae in between (these absent in some specimens); acr / dc ratio 1:1:1 or 9:10:9; posthumerals1 + 1; prealar twice as long as posterior notopleural (the latter strikingly short and only half length of anterior notopleural seta); dorsal surface of scutellum with about 6–18 setulose hairs on disc, except centrally; katepisternals 2 + 2, lower posterior nearly as long as upper posterior seta, lower anterior half length of upper anterior; anepisternum with a developed upper anterior setula.

Legs: rather long and slender, especially hind femora and tibiae. F2 with row of 3–4 pv on about basal half; f3 with 8–10 av, without pv; t1 with median 1 pv; t2 with 1 ad, 2 pd and 2p/pv; t3 with 1 av, 4 ad, 2 pd and 2–3 pv.

Wing: costa with marginal spinules rather long (Figs 155–158, 160) (at least as long as diameter of costa, and often exceeding this), the pair before distal break very long, 3–4 times length of adjacent spinules; lower crossvein sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.5 times length of preceding section. Lower squama as long as upper.

Wing length up to 6.0 mm.

Abdomen: rather long (2.7–3.0 times as long as wide, parallel-sided), in lateral view dorsoventrally compressed in basal two-thirds. 3rd sternite six times as long as wide, 4th sternite (Fig. 146) twice as long as wide, with long lateral setae and shorter discal setulae, without denser setae on posterior margin. 5th sternite processes (Figs 146, 147) with a few short setae laterally at their bases, otherwise with moderately long uniserial rows of setulae on their concave inner margins and 5–7 rather long setae apically; membranous lobes (Fig. 147) moderately projecting ventrally in lateral view. Central process of synsternite (6+7) (Fig. 150) with a rather long base bearing divergent winged arms. Surstylus (Fig. 145) downcurved, slightly constricted medially in lateral view, the upper dorsal margin with a small developed lobe. Cercal plate (Fig. 144) of about equal length and width, with a few short apical spinules and 1–2 pairs of longer setulae on either side of them, otherwise setulose only on basal half, in lateral view apex slightly projecting, not concealed behind surstylus. Pregonite (Fig. 148) with 2 setulae on dorsal half of oblique distal margin; postgonite (Fig. 148) with strong setula (distal margin indented beyond setula). Distal section of aedeagus (Fig. 149) with a more or less upright dorsal process separated from its base by half its length, dorsal margin of distal section slightly concave in lateral view.



Figs 151–160. Details of *Anthomyia abyssinica* Jaennicke. 151. ♀ arista (Ethiopia). 152. ♂ arista (Kenya). 153. ♀ arista (Nigeria). 154. ♀ arista (Malawi). 155. ♀ costal spines (Nigeria). 156. ♂ costal spines (Kenya). 157. ♀ costal spines (Nigeria). 158. ♀ costal spines (Malawi). 159. ♀ arista (holotype, Ethiopia). 160. ♀ costal spines (holotype, Ethiopia).

Female:

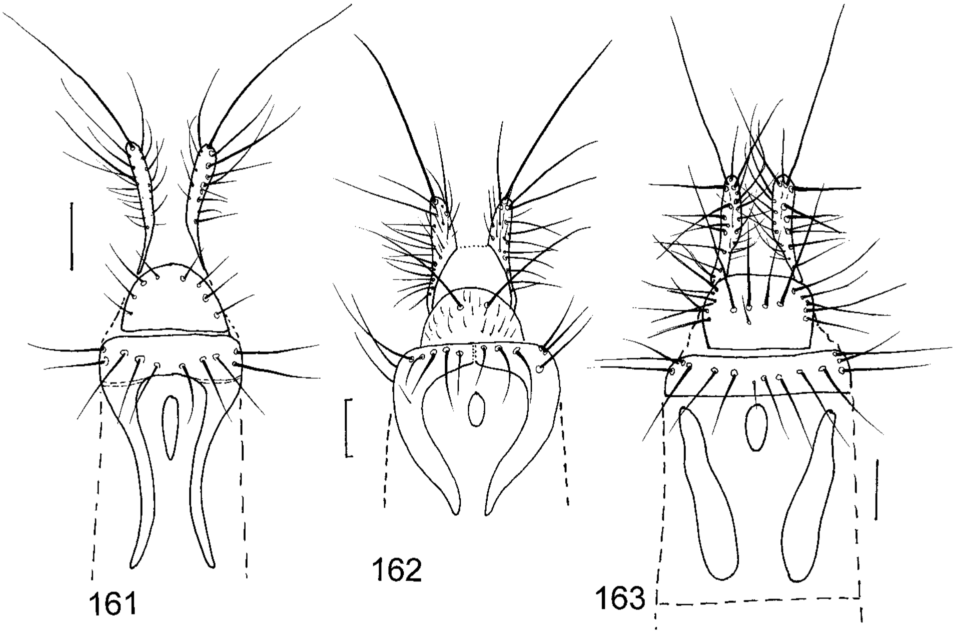
Colour: Head dark as in male. Thoracic pattern very similar to that of male, scutellum with apical grey spot minute. Abdomen often orange, with black and grey pattern on abdominal tergites similar to that of male (or in some specimens with central and lateral black marks separate, not connected along anterior margins of tergites). Legs dark to reddish orange as in male.

Head: Eyes widely separated (by slightly more than their transverse width, ratio 6:7:6); interfrontalia at level of middle ors about thrice as wide as each parafrontal; parafrontalia widening anteriorly to about width of first flagellomere; genae below lowest point of eye margin about 0.2 times eye-height. Arista plumose as in male (sometimes with even longer hairs). Parafrontal setae differentiated into 3 pairs of orbital setae (anterior setae normally proclinate, posterior two reclinate) + 1 pair of (inwardly directed) frontal setae; crossed interfrontal setae well developed, their tips reaching margins of frontal stripe.

Thorax: Presutural acrostichal setulae sometimes slightly more widely separated than in ♂, and generally with a few setulae between rows. Katepisternals 2 + 2, both lower setae half length of upper setae.

Wing length up to 6 mm.

Abdomen: Postabdomen equal in length to preabdomen. Ovipositor similar to *A. benguellae*; cerci with a long apical seta, and anterior sclerotized arms of tergite 8 long and slender (Fig. 161)



Figs 161–163. Apical segments of ♀ ovipositors. 161. *Anthomyia abyssinica* Jaennicke (Kenya). 162 *Anthomyia subabyssinica* sp. n. (KwaZulu-Natal, South Africa). 163. *Anthomyia acutula* sp. n. (Namibia).

Discussion: I was able to examine the ♀ holotype of *Anthomyia abyssinica* Jaennicke through the kindness of Dr W. Tobias. Although in poor condition, with the right wing missing, left wing damaged, the costal spine(s) and adjacent spinules are still present on the left wing, and the aristae are still present (Figs 159, 160). The presutural black spots on the thorax are rectangular, posterior margin reaching the 2nd presutural dorsocentral setae, and are narrowly joined behind head, the postsutural crossband is complete, and the prealar seta is longer than the posterior notopleural seta.

When Malloch described *spinigera* in 1924, he applied in the same paper the name *abyssinica* Jaenn. to three males (Estcourt, Natal) in which the aristal hairs were not twice as long as the basal diameter of the arista, and (in the key) the costal spine was small or minute, not very distinctly visible. Although Jaennicke in his original description says 'arista weakly haired' he added 'foremargin of wing armed with a strong spine'. Stein, who examined the holotype in 1902, stated that 'the arista was distinctly and rather long haired'. The specimens identified as '*abyssinica'* by Malloch (which carry a label to that effect) cannot be the males of *abyssinica*, and are described in this paper as *subabyssinica* sp. n.

Emden followed Malloch's usage of the name *abyssinica* and retained *spinigera* for the species with longer aristal hairs and a strong costal spine.

There is some variation in the length of aristal hairs in *abyssinica;* those from high altitudes in the Kenyan mountains tend to have the total width of hairing approaching the width of the first flagellomere (Fig. 152), and in some specimens from lower altitudes the total width is only about two-thirds this width (Fig. 154). The same variation applies to the length of the costal spine (even being different on each wing of the same specimen). The longest aristal hairs in *subabyssinica* are however only about one-third of the width of the first flagellomere, generally less than this. In addition some *abyssinica* (from Kenya particularly) have rather long scutal setae, and longer legs, especially the hind femora and tibiae.

In 1913 Stein recorded *abyssinica* from Ethiopia and Tanzania (Moschi near Kilimandjaro) and described the male. He stated that the arista was shortly, but distinctly haired, and that the wing had a distinct costal spine. This material was in the Hungarian Natural History Museum, and was destroyed in 1956. I found no specimens named by Stein in the BMNH. The identity of Stein's males of *abyssinica* must remain uncertain, but as Stein examined and recorded many specimens of *abyssinica* from central east Africa (where it is quite a common species) it seems probable that he correctly recognised this species. Emden (1951: 252) listed a male of *A. griseobasis* from the Democratic Republic of the Congo (Tshibinda), in the former Zaire [label on the pins says 'Tanganyika']; this specimen is in poor condition, I have dissected the genitalia, and it is *abyssinica* (arista and wings damaged, which is probably why Emden did not recognise it).

Nothing is known of the life history of *abyssinica*.

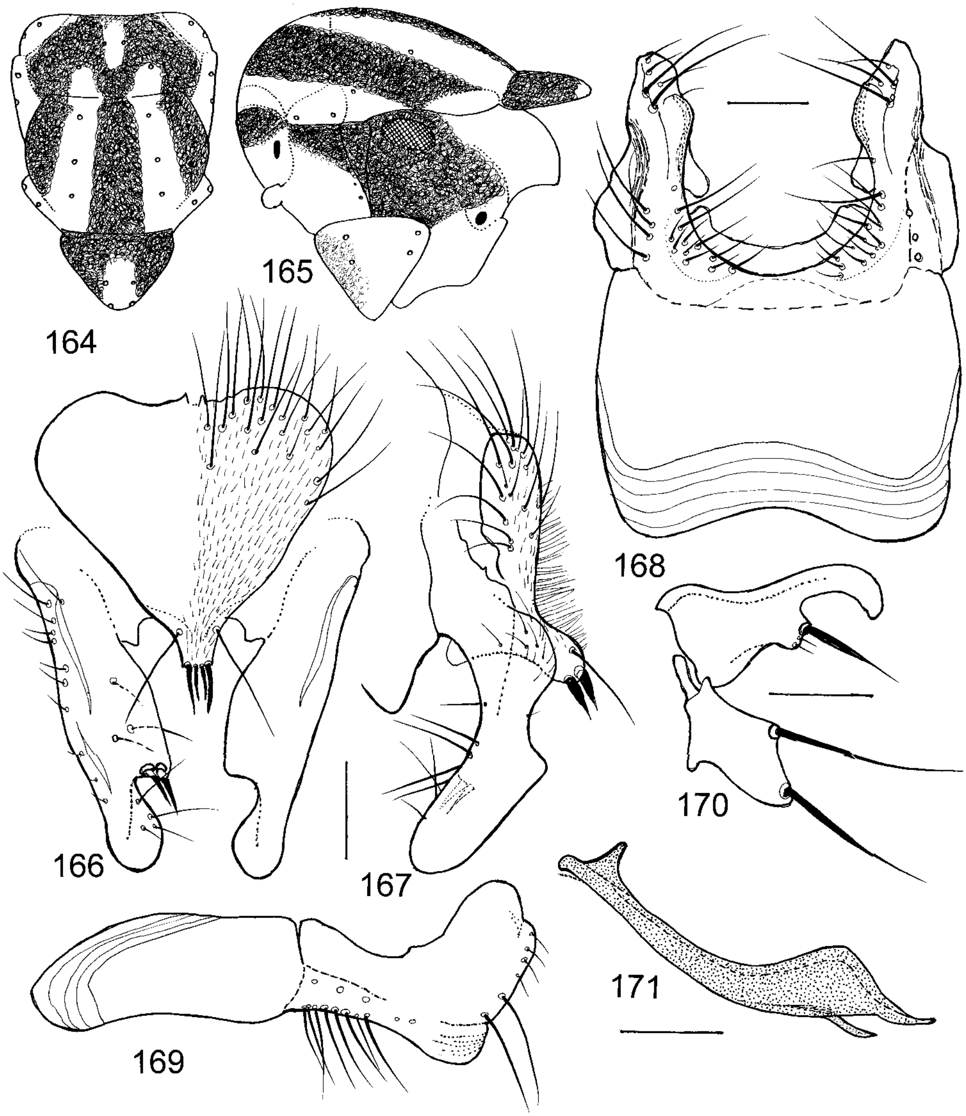
Distribution: The known distribution of *abyssinica* ranges from Ethiopia and the Sudan in the north, to South Africa in the south; it also occurs in Nigeria. Emden in 1951 recorded it from the Belgian Congo, and in 1956 from Ruanda (both as *spinigera*).

Anthomyia singularis (Stein, 1913)

(Figs 164–171)

Hylemyia singularis Stein, 1913: 555; Stein, 1914: 135; Stein, 1919: 151; Speiser, 1924: 103.
Anthomyia singularis: Emden, 1941*b*: 260; Emden, 1951: 352.
?Emmesomyia singularis: Malloch, 1924: 260.

Holotype ♀ : TANZANIA: 1♀ , Kilimandjaro, x.1904. The holotype was in the MNM, presumed destroyed in 1956.



Figs 164–171. *Anthomyia singularis* (Stein). ♂ (Kenya). 164. Thorax, dorsal view. 165. Ditto, lateral view. 166–171. Terminalia. 166. Cercal plate and surstyli, caudal view. 167. Ditto, lateral view. 168. 5th sternite, ventral view. 169. Ditto, lateral view. 170. Gonites. 171. Distal section of aedeagus.

Material examined: KENYA: 1♂, Kikuyu Escarp., Kijabe, 28.xi.1911–5.i.1912, 7–8000 ft, Dr J. Radford, Bamboo forest (BMNH); 1♀, Mt. Elgon, ii.1935, 10500–11500 ft., Heath zone, F. W. Edwards (BMNH); 1♂, Aberdare Range, Mt. Kinangop, 10000 ft, x.1934, F. W. Edwards, B. M. E. Afr. Exp. (in BMNH). UGANDA: 1♀, Mt. Elgon, Butandiga, 6.viii.1934, 7000 ft, short vegetation, J. Ford (BMNH).

Male:

Colour: Interfrontalia, parafrontalia and genae blackish (with rather dense silvery pile); parafrontals opposite lunule with a conspicuous dark grey sheen stripe (which is fairly conspicuous in any angle of vision) which extends from lunule to past level of arista, and a rather large blackish non-shifting spot in vibrissal angle which extends above genal groove to reach eye margin when viewed in profile, the silvery grey area between these darker markings rather smaller than in other species; face and occiput blackish (with normal dusting), except upper part of occiput rather shining blackish; frontal stripe black, parafacials infuscated in upper frons half. Antennae entirely dark brown to blackish. Palpi dark brown to black; arista brownish at base; prementum black, thinly dusted. Thorax (Figs 164, 165) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface; the black pattern consisting of longitudinal vittae; two wide lateral vittae which run obliquely from anterior margin of scutum to wing base, and a wide central vitta from suture to scutellum (as wide as distance between postsutural dorsocentral setae); this central vitta divides at suture into two short vittae which connect to the lateral vittae at level of presutural dorsocentrals; a further black lateral vitta runs across the pleura from humeral callus to wing base (across upper half of anepisternum) and continues across onto the laterotergite; scutellum largely black, with a rectangular grey spot on apical half. Abdomen largely densely dusted blackish ground-colour, with contrasting black and grey pattern on tergites (black central vitta on 3rd and 4th tergite as wide as depth of femur, and lateral marks more or less connected along anterior margins of tergites); pregenital sclerite contrastingly shining (undusted); hypopygium and 5th sternite rather finely dusted. Wing membrane slightly brownish grey tinged, especially basally; wing bases with brown veins; squamae paler than wing base with whitish fringes; halteres yellow. Legs entirely dark brown to blackish.

Head: Parafrontalia very narrow posteriorly (touching for a short distance), widening anteriorly to about two-thirds width of first flagellomere; eyes separated by slightly less than width of anterior ocellus; genae below lowest point of eye margin 0.24 times eye-height. 2 pairs of parafrontal setae on anterior half of distance between antennal base and anterior ocellus; rather long interfrontal setulae present (as long as posterior frontal seta); genal setae in more or less single row anteriorly. First flagellomere slightly more than twice as long as wide (apex not quite reaching lower facial margin); arista tapering from base to apex (not abruptly narrowing in distal two-thirds), nearly twice length of first flagellomere, short plumose, total width of hairing about half width of 1st flagellomere. Prementum about 0.4–0.5 times as long as head height.

Thorax: 3 pairs of presutural acrostichals (the middle the longest) in rows separated by about distance from each to adjacent dorsocentral row, with a few additional setulae in between; acr / dc ratio 1:1:1; posthumerals 1 + 1; prealar longer than posterior notopleural, but same length as anterior notopleural seta; dorsal surface of scutellum with a few setulae on disc; propleural depression finely setulose; katepisternals 2 + 2(3), lower posterior nearly as long as upper posterior seta, lower anterior half length of upper anterior seta; anepisternum with a strong upper anterior setula.

Legs: f2 with row of 3–4 pv on about basal half, no av; f3 with 8–9 av on whole length, and 4–6 pv; t1 with a very short ad, one longer median 1 pv; t2 with 1 ad, 2 pd and 2 p/pv; t3 with 1 av, 5–6 ad, 2 pd and 2–3 pv.

Wing: costa with basal marginal spinules short, about 1.5 times costal width, one of the pair before distal break nearly as long as upper crossvein; lower crossvein sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.4 times length of preceding section. Lower squama small and concealed under upper squama.

Wing length up to 5.5 mm.

Abdomen: More than twice as long as wide (2.6), dorsoventrally flattened in basal two-thirds, more or less parallel-sided from 2nd to 4th tergite. 5th sternite processes (Figs 168, 169) with a few short setae laterally at their bases, otherwise with irregularly biserial rows of not very long setulae on their concave inner margins (median setae much shorter than the others), processes rather close together; membranous lobes (Fig. 169) rounded and not strongly projecting in lateral view; in profile the setae on basal inner margins and the apical setae on processes separated by a gap. Surstylus (Fig. 167) downcurved, appearing constricted medially in lateral view with the distal part parallel-sided, bearing a ventral row of setulae and 2 short spinules below the angle of its inner lobe; in profile upper dorsal margin with a not very developed lobe. Cercal plate (Fig. 166) of about equal length and width, in apical third with more or less straight sides, but extreme apex narrow and constricted, with a few short apical spinules and one pair of long setulae on either side of them, otherwise setulose only on basal half, in profile apex projecting beyond surstylus, but upturned. Pregonite (Fig. 170) with 2 setulae on oblique distal margin; postgonite (Fig. 170) with a strong unexpanded setula (on ventroapical margin), the dorsal extension strongly excavated on ventral margin. Distal section of aedeagus (Fig. 171) with a concave dorsal margin (gradually upturned) in profile, with a small dorsal process basally which has a wide base but is short.

Female:

Colour: Head dark as in male, sheen stripes on parafacials wide and conspicuous, not disappearing in any angle of vision; upper part of parafrontals brownish infuscated at bases of anterior orbital seta (small and rounded spots, not fused together). Thoracic pattern very similar to that of male. Abdomen with black and grey pattern on abdominal tergites, central vitta wide (wider than depth of f3), and the rather narrow black anterior crossbands on each tergite widening out along lateral margins to the full length of tergites. Legs dark as in male.

Head: Eyes widely separated (by slightly more than their transverse width, ratio 25:30:25); interfrontalia at level of middle ors about thrice (3.3 times) as wide as each parafrontal; parafrontalia widening anteriorly to about width of first flagellomere; genae below lowest point of eye margin about 0.25 times eye-height. Parafrontal setae differentiated into 3 pairs of orbital setae (anterior setae normally proclinate, posterior two reclinate) + 1 pair of (inwardly directed) frontal setae; crossed interfrontal setae well developed, their tips reaching margins of frontal stripe.

Thorax: Presutural acrostichal setulae as in male; katepisternals 1 + 2 (lower posterior short and fine, a quarter length of upper posterior).

Legs: f2 with 1–2 av and 2–3 pv on basal half; f3 with 4–5 av , and 2 preapical pv; t1 with 1 p; t2 with 1 ad, 2 pd and 2 p/pv; t3 with 1 av, 4–5 ad and 2 pd.

Wing length up to 5.0 mm.

Abdomen: ovipositor not examined (cerci long and slender with long setulae).

Discussion: Stein (1913) described *A. singularis* from a female. He recorded a further female (Kilimandjaro, iv.1912) in 1914. Speiser (1924) in a list of flies from German East Africa, included *singularis*, and probably this was the material included in Stein's earlier record. Emden (1951) listed three specimens of *singularis* from East Africa. These are the same specimens I have examined for this paper. *A. singularis* was unknown to Malloch, who suggested (1924: 260) it might be placed in *Emmesomyia*.

The genitalia of *singularis* show some resemblance to *abyssinica*, differing mainly in the rather small dorsal process on the distal section of the aedeagus, and the shorter apical setae on the processes of the 5th sternite. The striking and unique pattern of the longitudinal vittae on the thorax in both sexes of *singularis* make identification easy, but although Stein (1913) was unsure about the aristal hairing 'Borste sehr kurz behaart, aber wie mir scheint, infolge von Abreitung…' and the wing costal spinules 'Flügel gelblich, wahrscheinlich mit Randdorn (die Stelle, wo er sitzt, ist an beiden Flügeln beschädigt)', the total width of aristal hairing in the specimens I have examined, is about half width of the first flagellomere, and the costal spine is nearly as long as the upper crossvein; in these two characters *singularis* is approaching the condition in some specimens of *abyssinica*.

Distribution: Only known from high altitudes on the mountains of East Africa (Kenya, Uganda and Tanzania).

Anthomyia malagasica sp. n.

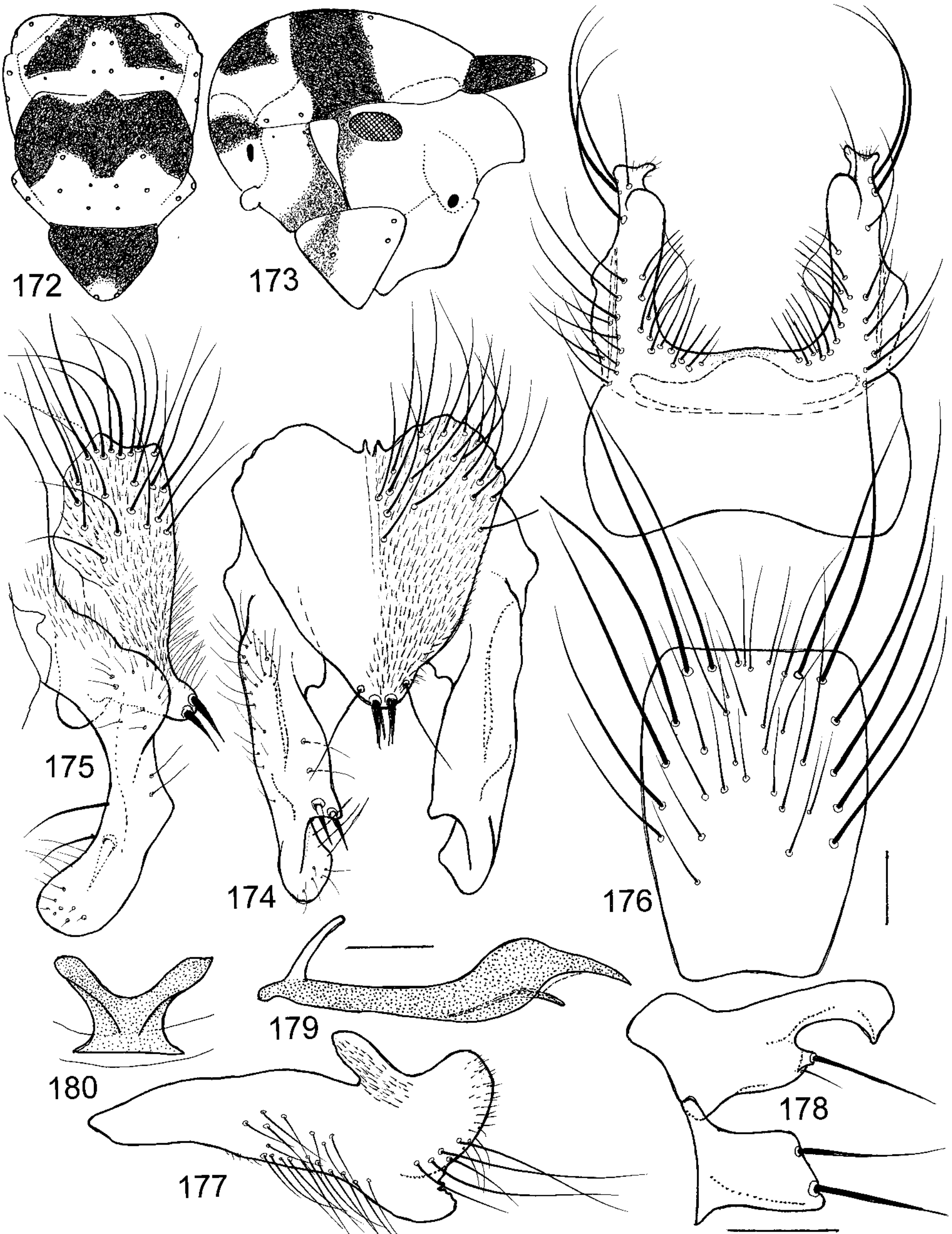
(Figs 172–180)

Holotype ♂: MADAGASCAR: 'Holotype' [circular white label with red perimeter]; 'Perinet / Madagascar / xii.1955 / B. Stuckenberg' [white printed rectangular label]; 'Holotype / *Anthomyia* ♂ / *malagasica* / D. M. Ackland' [red printed and written rectangular label]. Genitalia dissected and mounted in glycerol in a plastic tube on staging pin. In good condition, 3rd costal section of left wing missing. In NMSA.

Paratypes: MADAGASCAR: 2♂, Madagascar Centre, dist. Ambatolampy, Manjakatompo, 1700 m, 11–15.xii.1957, B. Stuckenberg; 1♂, Madagascar Centre, dist. Ambatolampy, Lac Froid, 1620 m, 11–15.xii.1957, B. Stuckenberg; 1♂, Ambohitantely, no date, Lot No. 4 (ex Inst. Scient. Madagascar). All paratypes in NMSA.

Etymology: From Malagasy, the old name for Madagascar.

The following material contains those males which have smaller membranous lobes on the inner margin of processes of the 5th sternite (and smaller dorsal processes of the distal section of the aedeagus) than the type material; the females cannot be separated on external morphological characters, or associated with either the type material or with the males included in 'other material'. As males of both forms were caught together in some localities, it is by no means certain that females with the same data labels are conspecific.



Figs 172–180. *Anthomyia malagasica* sp. n. ♂ holotype. 172. Thorax, dorsal view. 173. Ditto, lateral view. 174–180. Terminalia. 174. Cercal plate and surstyli, caudal view. 175. Ditto, lateral view. 176. 4th and 5th sternites, ventral view. 177. 5th sternite, lateral view. 178. Gonites. 179. Distal section of aedeagus. 180. Central process of synsternite (6+7).

Other material examined: MADAGASCAR: 1♂1♀, dist. Ambatolampy, Manjakatompo, 1700 m, 11–15.xii.1957; 2♀, same locality, forest station, i.1956; 2♂1♀, Ankaratra massif, Tsiafajavona Peak, i.1956; 1♂, Andringitra-Ambalavoa, Plateau Soaindrana, 2060 m, 14–17.i.1958; 1♂, dist. Ambatolampy, Col. Mahafompeno, 2400 m, 11–15.xii.1957; 1♀, Andringitra-Ambalavao, Vakoana, 1520 m, 21–24.i.1958; 1♀, Perinet, xii.1955; 1♀, Mt. d'Ambra, xii.1948; 1♀, same locality, 23.xi–4.xii.1957; 1♀, Moramanga dist., Niagarakely Forest, xii,1955; 1♀, Ambohitantely, no date, (ex Inst. Scient. Madagascar); 1♀, Madagascar Nord, Prairie de Listéres, Joffreville Diégo-Suarez, 840 m, 4.xii.1957. All material collected by B. Stuckenberg, and in NMSA.

Note on some of the localities kindly provided by Dr Stuckenberg: 'Perinet, the type locality, is a railway station with a small associated town to the east of Moramanga, on the railway line between Antananarivo and the eastern seaport of Tamatave. It is within the main eastern escarpment rainforest, and is now a proclaimed nature reserve. The escarpment more or less parallels the eastern coastline, and forest used to extend all along it as a consequence of the high monsoonal rainfall. The railway encouraged logging activities in the Perinet area, and I suspect that much of the forest has been degraded since my visit in 1955'.

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to blackish (with rather dense silvery dusting); parafrontals opposite lunule with a dark and rather persistent shifting sheen stripe which extends from level of lunule to level of arista (only shifting to silvery grey dusting in extreme dorsal view), and a wide brownish black non-shifting spot in vibrissal angle which extends above genal groove and reaches eye margin when viewed in profile; face and occiput blackish (with normal dusting), except upper part of occiput greyish. Antennae entirely dark brown. Palpi dark brown to black; prementum dark brown, thinly dusted and rather shining. Thorax (Figs 172, 173) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface (the grey presutural dusting becomes a darker greasy grey when viewed from a low angle in front; a wide transverse postsutural band across the scutum complete between wing bases (but posterior margin rather strongly indented around 3rd postsutural dorsocentral seta (grey dusting around base of latter); presutural spots joined behind head, each spot laterally and posteriorly with a straight border, forming a V shape (inner margins reaching the presutural acrostichal setulae, posterior margins at level of 2nd presutural dorsocentrals); scutellum almost entirely black (with only its extreme tip silvery grey). Pleura grey dusted, lower part of the post pronotal lobes and anterior and posterior part of anepisternum brownish black. Abdomen largely densely dusted over dark ground-colour (occasionally tinged reddish or orange in parts), with contrasting black and grey pattern on tergites (black central vitta on 3rd and 4th tergite as wide as depth of femur, joined anteriorly to a black crossband on each tergite (about one-third length of tergite) and expands laterally to about half length of tergite; hypopygium and 5th sternite rather finely dusted, the latter reddish brown and shining in places. Wing membrane weakly brownish orange tinged; wing bases with pale brownish veins, stem vein whitish; squamae concolorous with extreme wing base, with whitish fringes; halteres yellow. Legs dark brown (except for the partly shining trochanters which are sometimes orange-brown).

Head: Parafrontalia very narrow posteriorly (almost touching for a distance equal to twice diameter of anterior ocellus), widening anteriorly to about width of first flagellomere; parafacial two-thirds width of first flagellomere; eyes separated by diameter of anterior ocellus; genae below lowest point of eye margin 0.37–0.37 times eye-height. 2 pairs of short parafrontal setae on anterior half of distance between antennal base and anterior ocellus; very short but distinct interfrontal setulae present. First flagellomere slightly more than twice as long as wide (apex not quite reaching lower facial margin); arista slightly swollen at base, about 1.8 times length of first flagellomere, short plumose, total width of hairing equal to about half width of first flagellomere. Prementum about 0.4 times as long as head height.

Thorax: 3–4 pairs of presutural acrostichals (the middle the longest) in rows separated by slightly more than distance from each to adjacent dorsocentral row, without additional setulae in between rows; acr / dc ratio 9:10:9; posthumerals 1 + 1; prealar about 1.5 times as long as posterior notopleural (the latter short and only three-quarters length of anterior notopleural seta); dorsal surface of scutellum without setulose hairs on disc, preapical discal setae half length of apicals; katepisternals 2 + 2, lower posterior nearly as long as upper posterior seta, lower anterior half length of upper anterior; anepisternum with a developed upper anterior setula.

Legs: of normal length. F2 with row of 4–6 pv (unequal in length) on about basal three-quarters (holotype with a strong av basally on left mid femur only); f3 with 8–10 strong av on whole length, and from 0–5 finer pv setae; t1 with 2 strong median pv in holotype, but other specimens with only 1; t2 with 1 strong ad, 2 pd and 2 p/pv; t3 with 1–2 av, 4 ad, 2 pd and 2–3 pv.

Wing: costa with marginal spinules short (not as long as diameter of costa,), the pair before distal break distinct but only about twice length of adjacent spinules; lower crossvein sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.5 times length of preceding section. Lower squama nearly as long as upper.

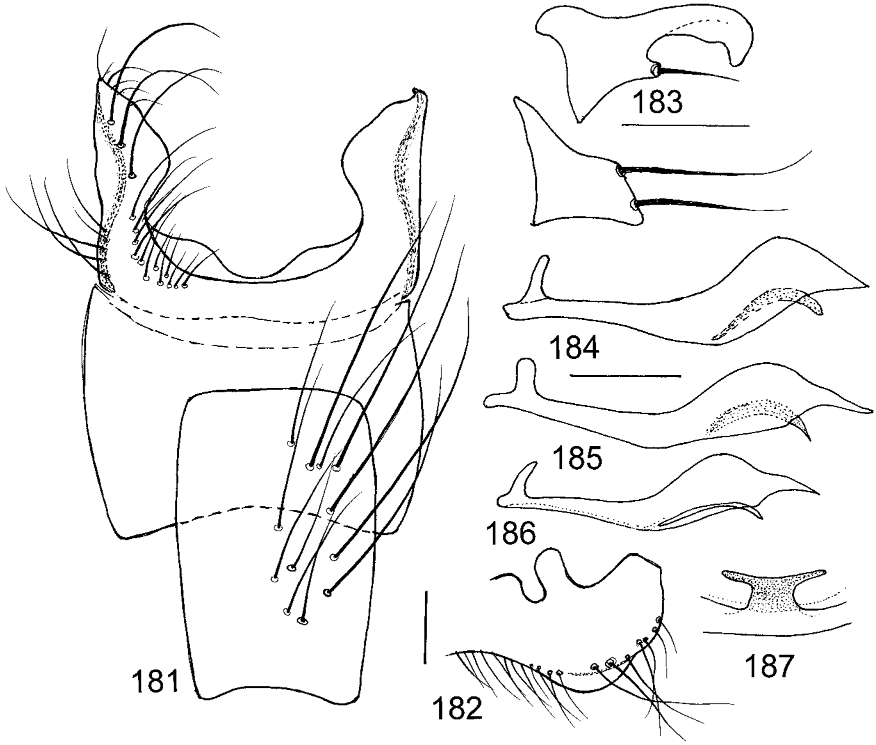
Wing length up to 5.5 mm.

Abdomen: as long as thorax (2.5 times as long as wide, parallel-sided), in lateral view dorsoventrally compressed in basal two-thirds. 4th sternite (Fig. 176) 2.5 times as long as wide, rectangular, with long lateral setae and shorter discal setulae, without denser setae on posterior margin. 5th sternite processes (Figs 176, 177) with 4–7 setae laterally at their bases, otherwise with moderately long uni-biserial rows of setulae on their concave inner margins and 2–3 rather long setae apically; membranous lobes (Fig. 177) moderately projecting ventrally in lateral view, with posterior margins at right angles to the apical part of processes. Central process of synsternite (6+7) (Fig. 179) with divergent winged arms. Surstylus (Fig. 175) downcurved, slightly constricted medially in lateral view, upper dorsal margin with a small developed lobe. Cercal plate (Fig. 174) of about equal length and width, with 4 short expanded apical spinules which are arranged with one pair below the other, and 1 pair of longer setulae on either side of them, otherwise setulose only on basal half, in profile apex slightly projecting at right angles, not concealed behind surstylus. Pregonite (Fig. 178) slightly longer than wide, with 2 setulae on oblique distal margin; postgonite with a rather long anteroventral setula which arises from a small tubercle, (anteroventral margin indented beyond setula); distal section of aedeagus (Fig. 179) with a long proclinate dorsal process separated from its base by one-third its length.

Female: Not identified with certainty. A female from the type locality of Perinet (without head) has the same scutal pattern as the holotype. Of the eleven females listed in 'other material' those from Montagne d'Ambre (1♀), Manjakatompo (2♀), Prairie de listéres (1♀), have 2 av on the hind tibia and 2 ad on the fore tibia; the other female from Manjakatompo has only 1 seta on each of these legs. The same variation in leg chaetotaxy occurs in the males.

Discussion: The material from Madagascar can be divided into two segregates in the male sex. The name *malagasica* is restricted to the specimens where the membranous lobe on the processes of the 5th sternite are larger, with longer setae on the inner basal margins of the processes, and with the distal angle between the lobe and the process being more acute (angle about 90° (posterior margin of lobe often very membranous and jagged); a long and strong dorsal projection on the distal section of the aedeagus is also present.

The other segregate (Figs 181–187), which has a smaller membranous lobe (Fig. 182), shorter setae on the inner margins of processes (Fig. 189), and a reduced dorsal process on the distal section of the aedeagus, is listed as 'other material', together with all females.



Figs 181–187. *Anthomyia* sp. (?*malagasica*). ♂ terminalia. 181. 4th and 5th sternites, ventral view (Manjakotompo). 182. Ditto, lateral view. 183. Gonites. 184. Distal section of aedeagus (Manjakotompo). 185. Ditto (Ankaratra). 186. Ditto, (Plateau Soaindra). 187. Central process of synsternite (6+7) (Ankaratra).

A. malagasica bears a considerable resemblance to *acutula* sp. n. from Kenya and southern Africa. In *acutula* the membranous lobes on the 5th sternite are slightly larger than *malagasica*, and the distal margins also form a right angle to the processes, and the latter bear equally long setae; the distal section of the aedeagus in *acutula* however lacks a dorsal projection on the distal section. The cercal plate in *acutula* also has a longer projecting apex (especially in lateral view). *A. malagasica* is also closely related to *abyssinica*, but the aristal hairing in *malagasica* is about one-third to one-half the width of the first flagellomere (in *abyssinica* three-quarters to fully that width), and the costal spine in *malagasica* is shorter.

There is no information on the habits or life history of *malagasica*.

Distribution: Madagascar.

Anthomyia subabyssinica sp. n.

(Figs 162, 188–199)

'*Anthomyia abyssinica* Jaennicke'. Malloch, 1924: 273; Emden, 1941*b*: 261; Emden, 1948: 163 (in part).

Holotype ♂: 'SOUTH AFRICA: *KwaZulu-Natal*: Natal / Weenen Nature Reserve / 28°51'S:29°59E / Thornveld, Malaise / trap, dam, 1–4.x.1990 / A. E. Whittington' [white rectangular printed label]; 'HOLOTYPE ♂ / *Anthomyia* / *subabyssinica* / D. M. Ackland' [red rectangular printed and written label]; 'Holotype' [circular white label with red perimeter]. Genitalia dissected and mounted in glycerol in a plastic tube mounted on the pin. In good condition. In NMSA.

Paratypes: BOTSWANA: 2♂, Kenye, i.1956, F. Zumpt (BMNH); 3♂, Lake Ngami (B9), 12 mls NE Sehithwa, 16–17.iv.1972, Southern African Exp., 1972 (BMNH); 1♂, Tsessebe, i.1956, F. Zumpt (BMNH). SOUTH AFRICA: *North West*: 1♂, Brits, 7.iii.1955, under large fig, Paterson (BMNH). *KwaZulu-Natal*: 1♂, Ramsgate, SE3030CD, 11–12.i.1985, J. Londt, Malaise trap set in riverine bush (NMSA); 1♂, Mkuzi Game Reserve, *ca.* 27°35'S:32°13'E, 1.ii.1988, J. G. H. Londt, 100 m, main camp & caravan park areas (NMSA); 1♂, Ashburton, 15 km SE of Pietermaritzburg, 19–25.ii.1977, J. G. H. Londt, Malaise in grassland (NMSA); 2♂, Empangeni, Malaise trap, 28°38'S:31°42'E, 5–15.i.1990, P. E. Reavell (NMSA); 1♂, Weenen N. R., #100, 35 km NE Estcourt, 28°52'S:30°00'E, 1100 m, 2–9.xii.1991, B. Perrin & K. Goddard, Malaise trap (NMSA); 1♂, Zululand, Ingwavuma, 10.x.1963, B. & P. Stuckenberg (NMSA); 1♂, Estcourt, ix–x.1896, G. A. K. Marshall, (det. *Anthomyia abyssinica* Jaen. by J. R. Malloch) (BMNH); Weenen, 14♂, same locality and data as holotype (NMSA); 1♂, same locality, iii.1924, H. P. Thomasset (1♂ det. *Anthomyia abyssinica* Jaen. by van Emden, 1942). UGANDA: 1♂, Mbarara, 15.xi.1934, F. W. Edwards (det. *Anthomyia amoena* Macq. by van Emden, 1940). YEMEN: 1♂, Jebel Jihaf, *ca.* 7100 ft, ix.1937, B. M. Exp. to SW Arabia (det. *Anthomyia amoena* Macq. by van Emden, 1940) (BMNH). TANZANIA: 2♂, ex coll. W. H. Potts, no other data (BMNH).

All the above ♂ paratypes have been dissected, and confirmed as having the same genitalia as the holotype.

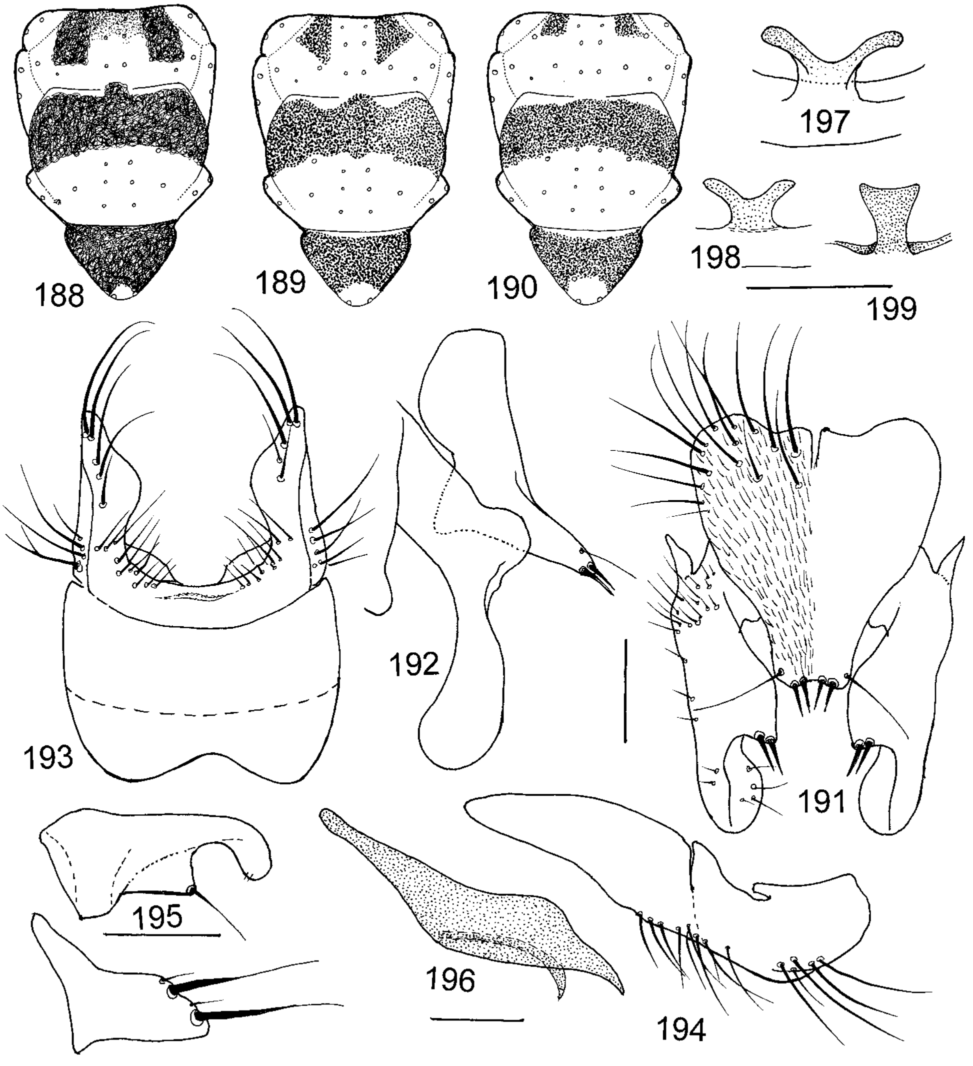
Other material is listed below which probably belong to *subabyssinica*, but a definite identification of the males requires dissection; a large number of the females probably also belong to *subabyssinica*, especially if caught at the same time and place as identified males:

BOTSWANA: 8♂17♀, Lake Ngami (B9), 12 mls NE Sehithwa, 16–17.iv.1972, Southern African Exp., 1972 (BMNH); 1♂3♀, Tsessebe, i.1956, F. Zumpt (BMNH). MALAWI: 1♀, Viphya Mtns., Chikangawa, 1133Dd, 5–8.xii.1980, 1700 m, B.Stuckenberg & J. Londt, forest edge & grassl. (NMSA). NAMIBIA: 1♂, West Caprivi Park, Kwandu River, Susuwe, 17°43'37"S:23°20'55"E, 28.ix.–2.x.1998, Malaise trap, dry woodland, A. H. Kirk-Spriggs (NMWN). SOUTH AFRICA: *Mpumalanga*: 1♀, Houtbosloop River nr Rivulets, Nelspruit Dist., 3530BC, 6.xi.1970, B. Stuckenberg, gallery forest (NMSA). *North West*: 1♀, Boekenhoutfontein, 24 km NW Rustenburg, 15.viii.1976, P. Ferrar (NMSA); 1♂, Brits, 7.iii.1955, Paterson, under large fig (BMNH); 1♂, same locality, 25.x.1952, Paterson, (BMNH); 1♀, same locality, 11.xi.1955, Paterson, under fig (BMNH); 1♀, Ottoshoop, iv.1916, H. G. Breyer (NMSA); 1♀, Potchefstroom, 1.ii.1953, Paterson (BMNH); 1♀, same locality, 8.xii.1952, Paterson (BMNH). *KwaZulu-Natal*: 2♀, Giant's Game Reserve, Injamuti area, SE2929AB, 5–11.xii.1983, J. G. Londt (NMSA); 2♂, Estcourt, ix–x.1896, G. A. K. Marshall (BMNH); 8♂10♀, Weenen Nature Reserve, 28°51'S:29°59'E, 1–4.x.1990, A. E. Whittington, Thornveld, Malaise trap, dam (NMSA); 2♂6♀, Weenen N. R., #100, 35 km NE Estcourt, 28°52'S:30°00'E, 1100 m, 2–9.xii.1991, B. Perrin & K. Goddard, Malaise trap (NMSA); 1♂, Weenen, iii.1924, H. P. Thomasset (det. *Limnophora bisetosa* Wd. by E. Brunetti, 1925) (BMNH); 1♀, Weenen, iv.1924, H. P. Thomasset (det. *Anthomyia abyssinica* by van Emden, 1942) (BMNH); 1♂, Empangeni, Malaise trap, 28°38'S:31°42'E, 5–15.i.1990, P. E. Reavell (NMSA); 1♀, same data but 20.i.1990 (NMSA); 1♂2♀, Ashburton, 15 km SE Pietermaritzburg, i.1977, J. G. H. Londt, Malaise in grassland (NMSA); 1♀, Spioenkop, #1, 28°37'S:28°31'E, 5–8.ix.1988, R. M. Miller (NMSA). *Gauteng*: 1♀, Johannesburg, 10.x.1949, F. Zumpt, stool (BMNH); 1♀, same locality, 16.vii.1950 F. Zumpt (BMNH); 1♀, same locality, 14.ix.1949, F. Zumpt (BMNH); 1♀, same locality, Parkstown North, 1.ii.1930, B. de Meillon (BMNH). *Eastern Cape*: 1♀, Klein-Vis Riv., 3225CB, 8 km W Somerset East, 29.x.1978, R. Miller & J. Londt, river bank (NMSA); 1♀, 16 mls E of Cradock Farm 'Who can tell', 3225Bb, 11.iii.1972, 100 m, M. E. & B. J. Irwin (NMSA). TANZANIA: 1♂, ex coll. W. H. Potts, no other data [donated to BMNH in 1967] (BMNH). ZIMBABWE: 1♂, Salisbury, vii.1957, N. L. H. Krauss (BMNH); 1♂, Mazowe, 27.ii.1997, J. W. Ismay (DMA); 3♀, Harare, Botanic gardens, 20–21.ii.1997, J. W. Ismay (DMA).

Etymology: The prefix *sub* indicates that this species was originally misidentified as *abyssinica*.

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to blackish (with rather dense silvery dusting); parafrontals opposite lunule with a brownish shifting sheen stripe which extends from lunule to level of arista, and a brownish black non-shifting spot in vibrissal angle which extends above genal groove to eye margin when viewed in profile; face and occiput blackish (with normal dusting), except upper part of occiput rather shining blackish. Antennae entirely dark brown to blackish. Palpi dark greyish dusted; arista brownish at base; prementum dark brown, thinly dusted, extreme base shining. Thorax (Figs 188, 189) densely dusted (over dark ground-colour) with contrasting black and silvery grey pattern on dorsal surface; transverse postsutural band



Figs 188–199. *Anthomyia subabyssinica* sp. n. 188. ♂ thorax, dorsal view (KwaZulu-Natal, South Africa). 189. Ditto (Botswana). 190. ♀ thorax. dorsal view (Botswana). 191–199. ♂ terminalia. 191. Cercal plate and surstyli, caudal view (paratype, KwaZulu-Natal). 192. Ditto, lateral view (paratype, KwaZulu-Natal) (setae omitted). 193. 5th sternite, ventral view (holotype, KwaZulu-Natal). 194. Ditto, lateral view. 195. Gonites (paratype, KwaZulu-Natal). 196. Distal section of aedeagus (paratype, KwaZulu-Natal). 197–199. Central process of synsternite (6+7). 197. Holotype (KwaZulu-Natal). 198. Paratype (Botswana). 199. Paratype (Botswana).

across the scutum complete between wing bases (posterior margin slightly indented, and only reaching 2nd postsutural dorsocentral seta; presutural spots small, joined immediately behind head by lighter greyish shading, each spot just reaching 2nd presutural dorsocentral seta on inner corner, but only reaching anterior posthumeral seta on outer corner (if more extensive, not reaching posterior posthumeral seta); scutellum largely black, with only its tip silvery grey. Pleura largely grey dusted, only lower part of the post pronotal lobes and anterior corner (and sometimes lower posterior corner) of anepisternum brownish black. Abdomen varying from mainly black to largely orange-yellow in ground colour, generally with some traces of orange-yellow on basal tergites, or with all tergites partly orange-yellow; viewed from behind with a blackish median vitta (about as wide as hind tibia) with anterior third to half of tergites blackish (shining in some angles of vision), tergites posteriorly with silvery dust; pregenital sclerite contrastingly shining brown or black; sternites orange, 5th sternite brownish with orange tips to processes. Wing membrane slightly pale yellowish brown tinged; wing with orange-brown veins; squamae paler than wing base with whitish fringes; halteres pale yellow. Legs varying from entirely dark brown to blackish, to largely orange, often with the coxae and trochanters contrasting with the dark femora, the latter sometimes orange basally and dark distally.

Head: Parafrontalia very narrow posteriorly (touching for a distance equal to length of ocellar tubercle) either separated by linear frontal stripe or touching), widening anteriorly to slightly less than width of first flagellomere; eyes separated by about half width of anterior ocellus; genae below lowest point of eye margin 0.15–0.18 times eye-height. 2 pairs of parafrontal setae on anterior third of distance between antennal base and anterior ocellus; short interfrontal setulae present. First flagellomere slightly more than twice (2.3 times) as long as wide (apex not quite reaching lower facial margin); arista slightly swollen at base (for a distance equal to width of first flagellomere), long pubescent, total width of hairing about one-third width of first flagellomere, longest hairs about as long as diameter of anterior ocellus. Prementum about 0.4 times as long as head height.

Thorax: 3 pairs of fairly strong presutural acrostichals (the middle the longest) in rows separated by about distance from each to adjacent dorsocentral row, without additional setulae in between; acr / dc ratio 1:1:1; posthumerals1 + 1; prealar as long as or longer than posterior notopleural, the latter however often considerably shorter than anterior notopleural (prealar 0.8 times length of anterior notopleural seta) ; dorsal surface of scutellum bare centrally, only 1–2 setulae towards sides; katepisternals 2 + 2, lower posterior three-quarters length of upper posterior, lower anterior seta half length of upper anterior and finer.

Legs: f2 with row of 3 pv on about basal half; f3 with 3–6 av in distal half, 4-6 pv; t1 with 1 median pv; t2 without ad, 1–2 pd and 2 p/pv; t3 with 1 av, 4–5 ad, 2 pd and 2 pv.

Wing: costa with all marginal spinules short (not quite as long as diameter of costa); the pair before distal break differentiated, but only about twice this length; lower cross-vein sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.6 times length of preceding section. Lower squama slightly smaller than upper.

Wing length up to 5.0 mm.

Abdomen: Slightly more than twice as long as wide (2.2), dorsoventrally flattened in basal two-thirds, more or less parallel-sided from 2nd to 4th tergite. 4th sternite about 1.5 times as long as wide, parallel-sided, with a straight posterior margin, with long and strong lateral setae (not denser on posterior margin) and a few setulae on disc. 5th sternite processes (Figs 193, 194) with a few short setae laterally at their bases, otherwise with short biserial rows of setulae on their concave inner margins (very short medially, becoming longer); membranous lobes (Fig. 194) small and rounded in lateral view. Central process of synsternite (6+7) (Figs 197–199) rather variable, generally flat in profile, wedge-shaped, or apical margin with produced corners (often extremely small and undeveloped, or absent in some specimens). Surstylus (Fig. 192) weakly downcurved, constricted medially in lateral view with the apical third more rounded than in *subornata*, bearing a ventral row of rather long setulae and 2 short spinules below the angle of its inner lobe; in profile upper dorsal margin with a well developed lobe. Cercal plate (Fig. 191) of about equal length and width, apex rather wider than in *subornata*, with generally 4 apical spinules and 1 pair of longer setulae on either side of them, otherwise setulose only on basal half, in profile apex strongly projecting in a more or less ventral direction well beyond surstylus. Pregonite (Fig. 195) distinctly longer than wide, with 2 normal setulae on oblique distal margin; postgonite (Fig. 195) with a short setula on lower margin, apical dorsal extension of postgonite strongly concave ventrally. Distal section of aedeagus (Fig. 196) rather short, without a dorsal process at base, dorsal margin of the short distal section slightly concave in lateral view.

Female: The female of *A. subornata* is unknown, but as the males of *subabyssinica* and *subornata* can be separated by details of the genitalia, it is probable that the following description applies to both species.

Colour: Head dark as in male. Thoracic pattern very similar to that of male, postsutural transverse band sometimes more indented with grey dusting on anterior and posterior margins; scutellum with apical grey spot often larger than the male. Abdomen generally more orange, with black and grey pattern on abdominal tergites similar to that of male (or in some specimens with central and lateral black marks separate, not connected along anterior margins of tergites). Legs varying from all dark brownish (or even blackish) to mainly orange (femora often dark distally in contrast to the orange bases).

Head: Eyes widely separated (by more than their transverse width, ratio 10:13:10); interfrontalia at level of middle ors about thrice as wide as each parafrontal; parafrontalia widening anteriorly to about width of first flagellomere; genae below lowest point of eye margin about 0.2 times eye-height. Parafrontal setae differentiated into 3 pairs of orbital setae (anterior setae normally proclinate, posterior two reclinate) and one pair of (inwardly directed) frontal setae; crossed interfrontal setae well developed, their tips reaching margins of frontal stripe. Aristal hair length on average about one-third width of first flagellomere, varying from 0.25 (Weenen) to 0.45 (Lake Ngami).

Thorax: Katepisternals 2 + 2, both lower setae half length of upper setae.

Legs: f2 with 1–2 av; f3 with 3–5 av , and 1 preapical pv; t1 with 1 ad, 1 pv; t2 with 1 ad, 2 pd and 2 p/pv; t3 with 1 av, 5 ad and 2 pd.

Wing: costal spine length from 0.95–1.13 times length of upper crossvein.

Wing length up to 5.3 mm.

Abdomen: Postabdomen slightly shorter than preabdomen and rather wide (1.6 mm long and 0.5 mm wide at 4th tergite). 6th and 7th tergites with sclerotised lateral margins wider than in other species; the sclerotised anterior arms of 8th tergite shorter and curved inwards to median line. Cerci rather short, about 1.3 times length of 10th tergite, with 2 longer setulae apically. (Ovipositor Fig 162).

Discussion: Malloch (1924: 267, in key) included '*abyssinica* Jaen.' in a group which had the costal spine small or minute. In the same paper he described *spinigera*, which possessed a strong costal spine. In this paper *spinigera* and *abyssinica* are synonymised, and the species misidentified as '*abyssinica* Jaen.' is described as *subabyssinica* sp. n.

Emden followed Malloch's use of the name *abyssinica*. There are specimens of *subabyssinica* in the BMNH which carry det. labels '*abyssinica* Jaen.' by both Malloch and Emden. In addition, Emden identified a male from the Yemen, (Emden 1948: 163) and another male from Uganda as '*amoena* Macq'. (see under *amoena*).

Anthomyia subabyssinica is a common and widely spread species in Africa. It is superficially similar to other species of *Anthomyia*, which perhaps accounts for Emden identifying several specimens as '*amoena'*. Amongst the large number of specimens collected from the type locality by A. E. Whittington on the same day, there were 3♂ which had smaller presutural spots; on dissection these were found to have identical genitalia to *subornata* sp. n. Because these two species can only be reliably separated by small details of the male genitalia, I have only included males in the type series which have been dissected. Although the small isolated presutural spots in the male of *subornata* may appear to be a useful character in separating the two species, I do not think this character can be relied upon.

A. subabyssinica is one of the two species of afrotropical *Anthomyia* which lack a basal dorsal projection on the distal section of the aedeagus (the other being *acutula*). It can be separated from *acutula* by the shorter setae on the basal margins of the processes of the 5th sternite, the smaller membranous lobes, and the process on systernite (6+7) which is small, flat (in lateral view) and with its arms basally attached (it appears somewhat variable, sometimes completely absent in a few specimens, and often more wedge-shaped).

Distribution: [Yemen (Arabian Peninsula)] to Uganda, Tanzania, Zimbabwe, South Africa, Namibia, Botswana.

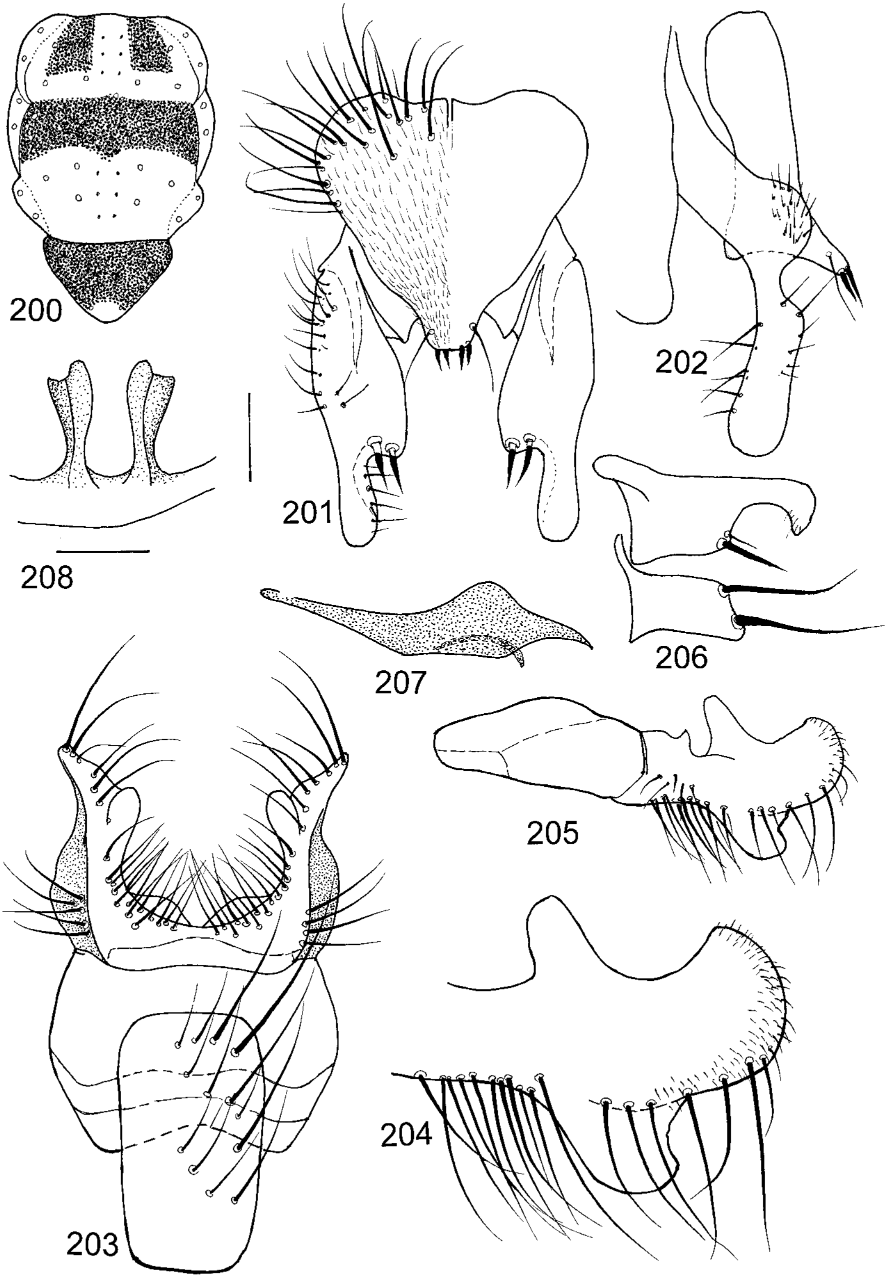
Anthomyia acutula sp. n.

(Figs 163, 200–208)

Holotype ♂: SOUTH AFRICA: *Western Cape*: 'SOUTH AFRICA (S24) / C. P. [Cape Province] Dwyka R. / Merweville-Koup Rd / 2.i.1972' [white rectangular printed label]; 'Southern / African Expd. / B. M. 1972–1' [white rectangular printed label]; 'Holotype' [white circular label with red perimeter]; 'HOLOTYPE ♂ / *Anthomyia acutula* / D. M. Ackland' [red rectangular printed and written label]. Genitalia dissected and mounted in plastic tube in glycerol on staging pin. In good condition. In BMNH.

Paratypes: KENYA: 2♂, Muguga, ix.1969, C. F. Dewhurst (BMNH). NAMIBIA: 1♂, (W52), Swakop R., 3 mls S Okahanja, 7.iv.1972, Southern African Expd. B. M. (BMNH); NAMIBIA: 6♂2♀ , Windhoek, SE 2217 Ca, 20.xi.–5.xii.1973, Malaise trap, H15789 (NMWN); 1♂, Windhoek, 22°34'S:17°05'E, 11.xii.1986, J. Irish, Malaise trap (all NMWN type series T635). SOUTH AFRICA: *Gauteng*: 1♂, Johannsburg, Parktown North, 1.ii.1930, B. de Meillon (BMNH); 1♂, Teakworth, 19.iv.1954, F. Zumpt (BMNH). *Free State*: 2♂, Viljoenskroom, 3.iv.1955, F. Zumpt (BMNH). *Western Cape*: 1♂4♀ , Karoo National Park, 15 km N Beaufort West, 12.xi.1986, 3222 AB, Londt & Quickelberg, dry *Acacia* woodland (NMSA).

Etymology: L. *acutulus* = rather subtle. Refers to the subtle characters defining the species.



Figs 200–208. *Anthomyia acutula* sp. n. holotype ♂. 200. Thorax, dorsal view. 201–208. Terminalia. 201. Cercal plate and surstyli, caudal view. 202. Ditto, lateral view. 203. 4th and 5th sternites, ventral view. 204. 5th sternite, lateral view. 205. Ditto. 206. Gonites. 207. Distal section of aedeagus. 208. Central process of synsternite (6+7).

Male: Differs from *subabyssinica* as follows: 5th sternite (Figs 203–205) with setae on inner margins of processes longer, those closest to median line equally as long as the others; processes in profile (Figs 204, 205) with the membranous lobes larger and more projecting ventrally, with the distal margin concave, or at right angles to the process; postgonite (Fig. 206) with the excavation apically on the ventral margin (beyond the small setula) smaller and less deep, hence apical finger-like extension shorter. Central processs of synsternite (6+7) (Fig. 208) larger, divided to base into two leaflike processes which are expanded apically when viewed in profile (not flat).

Female: Not distinguished with certainty from females of *subabyssinica*. The females listed as paratypes of *acutula* were all collected with males at the same time and place, and no males of *subabyssinica* were caught. The cerci of a female paratype from Namibia (Fig. 163) bears more robust setae, and the anterior sclerotised arms of tergite 8 are straight compared to *subabyssinica* (Fig. 162).

Discussion: *A. acutula* can generally be recognised without dissection by the larger membranous lobes on the processes of the 5th sternite. The distal margin (in lateral view) is generally rather ragged (often concave). *A. subornata* has a similar (slightly smaller) membranous lobe, but has a small dorsal projection on the distal section of the aedeagus, which is absent in *acutula*. In *acutula* also the pregonite is longer than wide, and the postgonite at the point of insertion of the seta on the ventro-apical margin is more or less obtuse, whilst in *subornata* the margin distal to the seta is strongly incised. There is no information on the life history. The specimens from the Karoo National Park were caught in a dry *Acacia* woodland.

Distribution: Only known from Kenya, Namibia and South Africa.

Anthomyia subornata sp. n.

(Figs 209–218)

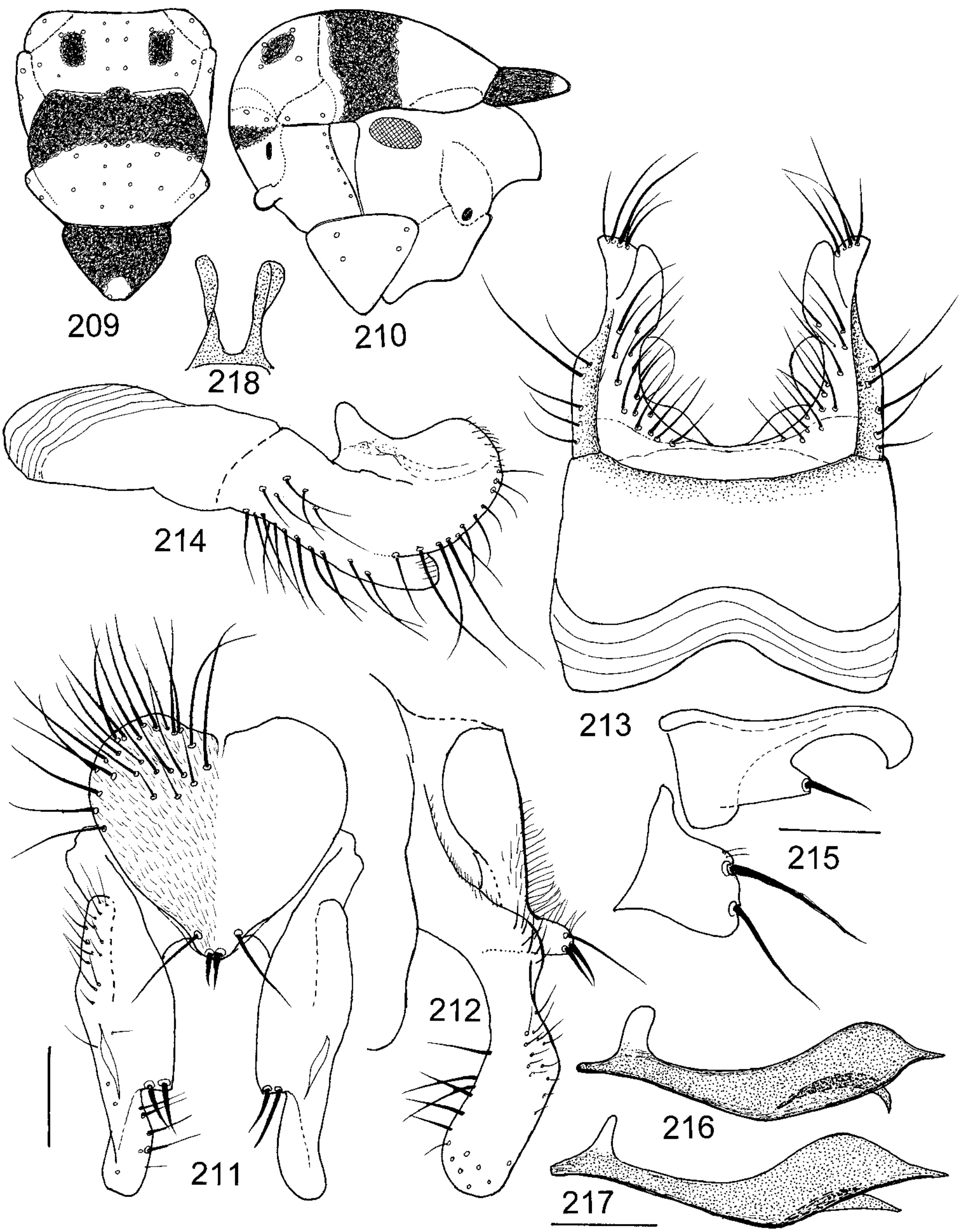
Anthomyia ornata (Bigot) var.? Malloch, 1924: 269, 272.

Holotype ♂: SOUTH AFRICA: *KwaZulu-Natal*: 'Holotype' [circular white printed label with red perimeter]; 'Estcourt, / Natal / Sept & Oct, 1896 / 1903–17' [rectangular white printed label]; '*Anthomyia* / *ornata* var. / Bigot / det J. R. Malloch' [rectangular white printed & handwritten label with black line border]; 'HOLOTYPE ♂ / *Anthomyia* / *subornata* / D. M. Ackland' [rectangular red printed & handwritten label]. In BMNH. In reasonable condition, right wing damaged, both hind tarsi missing.

SOUTH AFRICA: *KwaZulu-Natal*: 3♂, Weenen, 28°51'S:29°59'E, Thornveld, Malaise trap, dam, 1–4.x.1990, A. E. Whittington (NMSA); 1♂, Upper Tongaat, xi.1919, C. N. Barker (BMNH). *Northern Cape*: 1♂, Kimb[erley], x.1896 [month is partly obscured by pin hole], Pres. by Govt. Mus., Natal, 1911–45 (BMNH). The paratype from Upper Tongaat was labelled by Malloch '*Anthomyia ornata* var.'

Etymology: The suffix *sub* L. refers to the earlier association with *ornata* Big.

Male: Agrees with the description of *subabyssinica*, differing as follows: Arista shorter pubescent, longest hairs hardly longer than the diameter of arista at base; thorax (Figs 209, 210) with the presutural spots small, isolated, not joined to anterior margin of thorax with dark grey dusting; the outer posterior corner of the spot does not reach the posterior posthumeral seta. T2 with a small ad seta. Wing length up to 5 mm.



Figs 209–218. *Anthomyia subornata* sp. n. ♂. 209. Thorax, dorsal view (paratype, Upper Tongaat). 210. Ditto, lateral view. 211–218. Terminalia (KwaZulu-Natal). 211. Cercal plate and surstyli, caudal view. 212. Ditto, lateral view. 213. 5th sternite, ventral view. 214. Ditto, lateral view. 215. Gonites. 216. Distal section of aedeagus (Weenen, KwaZulu-Natal). 217. Ditto (Upper Tongaat, KwaZulu-Natal). 218. Central process of synsternite (6+7).

Postabdomen: 5th sternite processes with the membranous lobes (Fig. 214) on inner margin larger, the posterior margin in lateral view forming an acute angle with the distal part of the process; central process of synsternite (6+7) (Fig. 218) consisting of two separate, slightly foliate processes, not joined at base (in *subabyssinica* the process is flat, variably wedge-shaped, or with two short flat arms on posterior margin; surstylus (Fig. 212) in lateral view with the distal third parallel-sided, and the basal dorsal corner less prominent; cercal plate (Fig. 211) shorter, apex narrower and only slightly extended; in lateral view the apex is less projecting beyond the surstylus and is upturned at almost right angles to the rest of cercal plate. Pregonite (Fig. 215) shorter, with less oblique distal margin; postgonite (Fig. 215) with the apical dorsal extension longer. Distal section of aedeagus (Figs 216, 217) with a short stumpy basal dorsal process (slightly variable in lateral thickness in the specimens examined.

Female: unknown (but see description of *subabyssinica* female).

Discussion: Malloch (1924) listed two males as *ornata* Bigot var.? (see under *ornata*). These males represent a distinct species, with genitalia quite different from *ornata*, more resembling *subabyssinica* sp. n. A further three males were found in the Natal Museum material, captured at the same locality and on the same day as *subabyssinica*. Another rather old specimen was found in the BMNH from Kimberley (Northern Cape).

Distribution: Only known from South Africa (KwaZulu-Natal and Northern Cape).

Species *sola*

The following unique species does not seem to be related to any other species of *Anthomyia*. The projecting cercal plate in lateral view, and the small (hardly visible in lateral view) membranous lobes of the 5th sternite suggest that it might be related to the *abyssinica* superspecies. The uniramous central median process of the synsternite (6+7) is unique, but as only one male specimen is so far known, it is uncertain if this character is reliable.

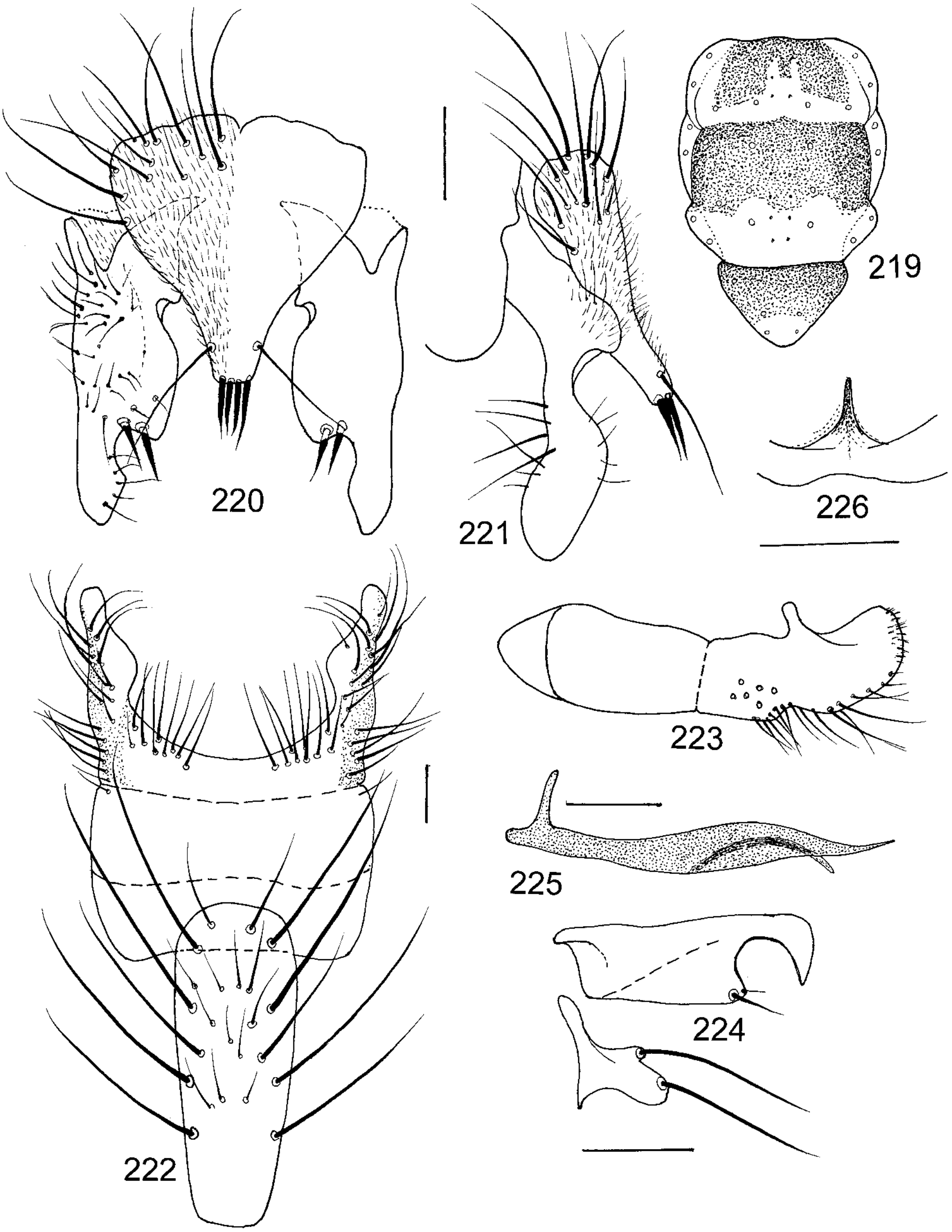
Anthomyia concava sp. n.

(Figs 220–226)

'*Anthomyia griseobasis* Malloch.' Emden, 1951: 352 (in part).

Holotype ♂: UGANDA: 'Holotype' [white circular printed label with red perimeter]; 'UGANDA: / Ruwenzori Range / xii.1934–i.1935 / B. M. E. Afr. Exp.' [white rectangular printed label]; 'Namwamba Valley / 6500ft / F. W. Edwards' [white rectangular printed label]; 'HOLOTYPE ♂ / *Anthomyia concava* / D. M. Ackland' [red rectangular printed and written label]. In reasonable condition, right wing missing. Genitalia dissected and mounted in glycerol in a plastic tube on staging pin. In BMNH.
Paratypes: KENYA: 1♀, Aberdare Range, Katamayo, x.1934, 8000 ft, F. W. Edwards, B. M. E. Afr. Exp. (BMNH); 1♀, W Ruwenzori, 8–9000 ft, vii.1945, van Someren, (det. *Anthomyia griseobasis* Mall., by van Emden, 1945) (BMNH); 1♀, Nairobi, vii.1930, van Someren (BMNH).
Other material examined: KENYA: 1♀, Teita Hills, (S), viii.1947, van Someren, (det. *Anthomyia benguellae* Mall. by van Emden, 1947 (BMNH).

Etymology: L. *concavus* = hollow. Refers to the concave sides to the cercal plate in the male.



Figs 219–226. *Anthomyia concava* sp. n. holotype ♂. 219. Thorax, dorsal view. 220–226. Terminalia. 220. Cercal plate and surstyli, caudal view. 221. Ditto, lateral view. 222. 4th and 5th sternites, ventral view. 223. 5th sternite, lateral view. 224. Gonites. 225. Distal section of aedeagus. 226. Central process of synsternite (6+7).

Male:

Colour: Interfrontalia, parafrontalia and genae varying from dark brown to blackish (with rather dense silvery dusting); parafrontals opposite lunule with a rather indistinct darker shifting sheen stripe which extends from lunule to level of arista, and a greyish brown non-shifting spot in vibrissal angle which extends above genal groove and reaches eye margin when viewed in profile; face and occiput brown (with normal dusting), except upper part of occiput slightly shining blackish. Antennae brown, pedicel orange distally. Palpi brownish orange; arista orange; prementum dark brown, rather shining. Thorax (Fig. 219) dusted greyish in parts (over orange ground-colour), presutural areas largely orange-brown and semi-shining, contrasting with grey dusting along suture, between presutural acrostichals and on post pronotal lobes; pleura with thin orange shifting grey dust over translucent orange ground colour; transverse postsutural band across the scutum semi-shining brownish orange, reaching midway between the 2nd and 3rd postsutural dorsocentral setae; complete between wing bases (posterior margin weakly indented); presutural spots large and ill defined, joined anteriorly; scutellum brown, with posterior half grey dusted. Abdomen largely densely dusted over dark ground-colour. Wing membrane weakly greyish; stem vein whitish in contrast to dark basicosta and the veins beyond humeral crossvein, which are brownish; halteres yellow. Legs dark brown (except for the partly shining trochanters which are orange).

Head: Parafrontalia very narrow posteriorly (touching in upper frons half), widening anteriorly to half width of first flagellomere; eyes separated by half width of anterior ocellus; genae below lowest point of eye margin 0.2–0.23 times eye-height. 2 pairs of parafrontal setae on anterior half of distance between antennal base and anterior ocellus; short interfrontal setulae present; genal setae in more or less single row anteriorly. First flagellomere slightly more than twice as long as wide (apex not quite reaching lower facial margin); arista slightly swollen basally, nearly twice length of first flagellomere, short plumose, longest hairs about one-third width of 1st flagellomere (total width of hairing about two-thirds of that width). Prementum about 0.4 times as long as head height.

Thorax: 3 pairs of strong presutural acrostichals (the middle the longest) in rows separated by about distance from each to adjacent dorsocentral row, without additional setulae in between; acr / dc ratio 1:1:1 or 9:10:9; posthumerals1 + 1; prealar nearly twice as long as posterior notopleural seta (which is however only half length of anterior notopleural seta); only 2–3 fine proepisternal hairs , dorsal surface of scutellum bare centrally between strong setae, only 1–2 setulae laterally above the marginal row; katepisternals 2 + 2, lower posterior nearly as long as upper anterior seta, lower anterior seta two-thirds length of upper; anepisternum with a developed upper anterior setula.

Legs: f2 with row of 5–6 pv on about basal half; f3 with 4–6 av in distal half; t1 with median 1 pv; t2 with 1 very short ad, 1–2 pd and 2 p/pv; t3 with 1 av, 2–3 ad, 2 pd and 2–3 pv. Pulvilli enlarged, those of fore legs nearly as long as 5th tarsal segment.

Wing: costa with all marginal spinules short; the pair before distal break distinct but short, hardly differentiated; lower cross-vein slightly sinuate, joining M_{1+2} obliquely; last section of M_{1+2} 1.87 times length of preceding section. Lower squama small, shorter than upper, and concealed by it.

Wing length 6.5 mm.

Abdomen: More than twice as long as wide (2.6), dorsoventrally flattened in basal two-thirds, more or less parallel-sided from 2nd to 4th tergite. 3rd sternite long and narrow, twice as long as wide; 4th sternite (Fig. 222) twice as long as wide, with a straight posterior margin, and 3–4 long lateral setae; 5th sternite processes (Figs 222, 223) (which are short and rather widely separated) with a few short setae laterally at their bases, otherwise with long biserial rows of setulae on their concave inner margins (median setae as long as the others); membranous lobes (Fig. 223) small and not visible in lateral view. Central process of synsternite (6+7) (Fig. 226) consisting of a single sharp pointed process. Surstylus (Fig. 221) hardly downcurved, appearing constricted medially in lateral view, bearing a ventral row of setulae and 2 short spinules below the angle of its inner lobe; in profile upper dorsal margin with a small but well-defined lobe, ventral margin sinuate. Cercal plate (Fig. 220) of about equal length and width, in apical third constricted, the margins being distinctly concave, with a few short apical spinules and one pair of quite long setulae on either side of them, otherwise setulose only on basal half, in profile apex strongly projecting, with dorsal surface almost straight. Pregonite (Fig. 224) very small (less than half length of postgonite) slightly constricted medially, with 2 setulae on oblique distal margin; postgonite (Fig. 224) with a very small unexpanded setula (on ventroapical margin), the dorsal projection strongly excavated on ventral margin, and the dorsal and ventral margins almost parallel. Distal section of aedeagus (Fig. 225) rather long and slender and hardly widened in distal half in profile, with a more or less upright dorsal process separated from its base by much less than its length.

Female:

Colour: similar to male. parafrontals opposite lunule with an orange-brown shifting sheen stripe, and another orange-brown spot in vibrissal angle which extends above genal groove and almost reaches eye margin; antennae dark brown, only indistinctly orange in places. Thorax with transverse postsutural band similar to male, only slightly shining orange and contrasting with the grey dusted ground colour; presutural spots also orange (it is unclear whether these orange spots are the normal condition in both males and females, but all the type material agree in this); scutellum brown with only the tip grey dusted.

Head: Eyes widely separated (by slightly more than their transverse width, ratio 5:6:5), interfrontalia at level of middle orbitals about 3 times as wide as each parafrontal; frontal stripe with convex margins. 3 pairs of orbitals and 1 pair of inclinate frontal setae.

Thorax: as male, except the presutural acrostichal setae have a few fine hairs between rows; Two of the three paratypes are lacking the usual fine setulae or hairs on both sides of the proepisternum (propleural depression), the other paratype (Ruwenzori) has 2–3 hairs on each side.

Legs: t1 with 1 ad and 1 pv setae (at about same level); t2 with a stronger ad seta; t3 with 1 av, 4–5 ad, 2 pd and 2–3 pv.

Abdomen: ovipositor about as long as abdomen; similar to *maculigena*.

Wing length 6.5 mm.

Discussion: The holotype of *concava* was listed under *griseobasis* by Emden (1951: 352), and found in the BMNH standing over this name. The female from the Aberdare

Range, Katamayo, in the same paper is, I believe, a female of *concava*. Another female (W Ruwenzori, van Someren), identified by Emden as *griseobasis*, is also *concava*. The female from the Teita Hills was identified by Emden as *benguellae*; it is in poor condition, but may be *concava*.

The general appearance of the holotype male of *concava* (with a largely orange-brown, rather translucent ground colour, and the usual black pattern represented by semi-shining orange-brown postsutural crossband) suggest it is an immature specimen. The genitalia are, however very distinctive. The concave lateral margins of the cercal plate, short surstyli, very small pregonite in relation to the postgonite, the absence of any membranous lobe on the processes of the 5th sternite, and above all, the single sharply pointed process on the synsternite (6+7) are worthy of mention. It is possible that the thorax pattern in any future material will exhibit a more typical black and grey pattern.

All three female paratypes have more or less the same orange-brown coloration as the holotype.

Distribution: Only known from the mountains of Kenya and Uganda.

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REFERENCES

ACKLAND, D. M. 1977. Some Anthomyiidae from Southern Spain, with descriptions of two new species (Insecta, Diptera). *Steenstrupia* **4** (18): 195–209.

——— 1987. The genus *Anthomyia* in the Oriental region (Diptera: Anthomyiidae). *Insecta matsumurana n. s.* **36**: 39–60.

——— 1995. Revision of Afrotropical *Emmesomyia* Malloch, 1917 (Diptera: Anthomyiidae), with descriptions of seven new species. *Annals of the Natal Museum* **36**: 21–86.

ACKLAND, D. M. & PONT, A. C. 1977. Family Anthomyiidae. *In*: Delfinado, M. D. & Hardy, D. E., eds, *A catalog of the Diptera of the oriental Region, Vol. III, Suborder Cyclorrhapha (excluding Division Aschiza)*. Honolulu: University Press of Hawaii, pp. 439–446.

ALBUQUERQUE, D. DE O. 1959. Contribuição ao conhecimento de *Pegomyia* R. –D. 1830 e *Hylemyia* (*Craspedochaeta*) Macquart, 1850, na América do sul, com descrições de espécies novas (Diptera–Muscidae). *Boletim do Museu Nacional*, (*n.s.*) *Zoologia*, *Rio de Janeiro* **210**: 1–50.

BEAVER, R. A. 1986. Some Diptera and their parasitoids bred from dead snails in Zambia. *Entomologist's Monthly Magazine* **122**: 195–199.

BEZZI, M. 1908. Ditteri Eritrei raccolti dal Dott. Andreini e dal Prof. Tellini. Parte seconda. Diptera cyclorrhapha. *Bollettino della Società Entomologica Italiana*, *Firenze* **1907**: 3–199.

——— 1923. Diptera, Bombyliidae, and Myiodaria (Coenosiinae, Muscinae, Calliphoridae, Sarcophaginae, Dexiinae, Tachininae), from the Seychelles and neighbouring islands. *Parasitology* **15**: 75–102.

Bezzi, M. & Lamb, C. G. 1926. Diptera (excluding Nematocera) from the Island of Rodriguez. *Transactions of the Entomological Society of London* **58**: 537–573.

Bigot, J. –M. –F. 1885. Diptères nouveaux ou peu connus, 25e partie. XXXIII. Anthomyzides nouvelles. *Annales de la Société entomologique de France* (6) **4** (4) [1884]: 263–304.

Büttiker, W., Attiah, M. D. & Pont, A. C. 1979. Insects of Saudi Arabia, Diptera: Synanthropic Flies. *Fauna of Saudi Arabia* **1**: 352–367.

Curran, C. H. 1927. New species of calyptrate Muscidae from Africa (Diptera). *Annals and Magazine of Natural History* (9) **19**: 527–533.

Cuthbertson, A. 1937. Biological notes on some Diptera in Southern Rhodesia. *Proceedings and Transactions of the Rhodesia Scientific Association*, *Bulawayo* **35**: 16–34.

Disney, R. H. L. 1973. A note on some filth–inhabiting flies of Cameroon. *Entomologist's Monthly Magazine* **108**: 212–213.

Emden, F. I. van. 1941*a*. Entomological Expedition to Abyssinia, 1926–27. Diptera Cyclorrhapha: Muscidae, I. *Annals and Magazine of Natural History* (11) **8**: 210–234.

——— 1941*b*. Keys to the Muscidae of the Ethiopian region: Scatophaginae, Anthomyiinae, Lispinae, Fanniinae. *Bulletin of Entomological Research* **32** (3): 251–275.

——— 1948. Diptera: Muscidae. *Expedition to South–West Arabia 1937–8*. London: British Museum (Natural History) **1**: 161–175.

——— 1951. Muscidae C. – Scatophaginae, Anthomyiinae, Lispinae, Fanniinae and Phaoniinae. *Ruwenzori Expedition 1934–35*. London: British Museum (Natural History) **2**: 325–710.

——— 1956. Contributions à l'étude de la faune entomologique du Ruanda-Urundi (Mission P. Basilewsky 1953). 108. Diptera Muscidae. *Annales du Musée Royal du Congo Belge* (Ser in 8 Sci. Zool.) **51**: 506–531.

——— 1958. Results of the Zoological Expedition of Professor Dr. Håkan Lindberg to the Cape Verde Islands in the winter 1953–54. No 24. Muscidae collected on the Cape Verde Islands. *Commentationes Biologicae*, *Helsingfors* **20** (1): 1–18.

Griffiths, G. C. D. 2001. Vol VII, Cyclorrhapha (Schizophora: Calyptratae). Part 2, Anthomyiidae. 13: 2121–2288. *In:* Griffiths, G. C. D., ed., *Flies of the Nearctic Region.* Stuttgart: Schweizerbart'sche Verlagsbuchhandlung.

Hennig, W. 1968. 7(1), Fam. 63a. Anthomyiidae. Lieferung 276: 193–240. *In:* Lindner, E., ed., *Die Fliegen der Palaearktischen Region*. Stuttgart: Schweizerbart'sche Verlagsbuchhandlung.

Jaennicke, F. 1867. Neue exotische Dipteren. *Abhandlungen der Senkenbergischen Naturforschenden Gesellschaften* **6**: 311–407.

Karl, O. 1935. Aussereuropäische Musciden (Anthomyiden) aus dem Deutschen Entomologischen Institut. *Arbeiten über Morphologie und taxonomische Entomologie*, *Berlin* **2**: 29–49.

McAlpine, J. F. 1981. Morphology and terminology–Adults. *In*: McAlpine, J. F. *et al*., eds, *Manual of Nearctic Diptera*. Volume 1. Hull (Quebec): Agriculture Canada, Research Branch (Monograph: No. 27) pp. 9–63.

Macquart, J. 1851. Diptères exotiques nouveaux ou peu connus. Suite du 4e supplément publié dans les mémoires de 1849 [concl.]. *Mémoires de la Societé des Sciences*, *de l'Agriculture et des Arts de Lille* **1850**: 134–294.

Malloch, J. R. 1921. Exotic Muscaridae (Diptera).–II. . *Annals and Magazine of Natural History* (9) **7**: 420–431.

——— 1924. Exotic Muscaridae (Diptera). – XIII. *Annals and Magazine of Natural History* (9) **14**: 257–274.

——— 1934. Diptera of Patagonia and South Chile. **7** (2): 171–346, figs 22–60. London.

Michelsen, V. 1980. The *Anthomyia pluvialis* complex in Europe (Diptera, Anthomyiidae). *Systematic Entomology* **5**: 281–290.

——— 1997. The Anthomyiidae (Diptera) described by C.R.W. Wiedemann. *Steenstrupia* **23**: 37–41.

Michelsen, V. & Báez, M. 1985. The Anthomyiidae (Diptera) of the Canary Islands. *Entomologica Scandinavica* **16**: 277–304.

Orian, A. J. E. 1962. A list of Diptera recorded from Mauritius. *Bulletin of the Department of Agriculture*, *Mauritius* **94**: 1–31.

Paterson, H. E. 1956. East-African Muscidae (Diptera). (Ergebnisse der Deutschen Zoologischen Ostafrika-Expedition 1951/1952. Gruppe Lindner, Stuttgart, No. 20.). *Beiträge zur Entomologie* **6** (1/2): 154–179.

Peris, S. V. 1963. Resultados de la expedición Peris-Alvarez a la isla de Annobón (Guinea española). 7. Diptera Muscidae. *Boletin de la Real Sociedad española de historia natural* (*biológia*) **61**: 101–121.

Pont, A. C. 1979. Diptera Muscidae and Anthomyiidae from the Comoros Archipelago. *Mémoirs du Muséum National d'Histoire naturelle*, *Zoologie. Paris* **109**: 333–365.

——— 2000. The Muscoidea (Insecta, Diptera) described by J. -M. -F. Bigot. *Occasional Papers on Systematic Entomology* **No. 12**, 40 pp.

Pont, A. C. & Ackland, D. M. 1980. Family Anthomyiidae. *In*: Crosskey, R.W., ed., *Catalogue of the Diptera of the Afrotropical Region*. London: British Museum (Natural History) pp. 715–718.

Speiser, P. 1910. 10. Diptera. 5. Cyclorhapha, Aschiza. *In*: Sjöstedt, B. Y., ed., *Wissenschaftliche Ergbenisse de Schwedischen-zoologischen Expedition nach dem Kilimandjaro*, *dem Meru und den umgebenden Massaisteppen Deutsch Ostafrikas*, 1905–1906. Stockholm pp. 113–202.

——— 1924. Eine Übersicht über die Dipterenfauna Deutsch-Ostafrikas. *Beiträge zur Tierkunde*, *Königsberg* **1924**: 90–156.

Stein, P. 1901. Die Walker'schen aussereuropäischen Anthomyiden in der Sammlung des British Museum zu London (Dipt.). *Zeitschrift für systematische Hymenopterologie und Dipterologie*, *Leipzig* **4**: 185–221.

——— 1902. Einige Wiedemann'sche u. Jaennicke'sche aussereuropäische Anthomyiden (Dipt.). *Zeitschrift für Hymenopterologie und Dipterologie*. **3**: 129–137.

——— 1904. Die amerikanischen Anthomyiden des Königlichen Museums für Naturkunde zu Berlin und des Ungarischen National-Museums zu Budapest. *Annales Historico–Naturales Musei Nationalis Hungarici* **2**: 414–495.

——— 1906. Die Afrikanischen Anthomyiden des Königl. Zoologischen Museums zu Berlin. *Berliner Entomologischer Zeitschrift* **51**: 33–80.

——— 1907. Revision der Bigot'schen und einiger von Macquart beschriebenen aussereuropäischen Anthomyiden (Dipt.). [Concl.]. *Zeitschrift für systematische Hymenopterologie und Dipterologie*, *Leipzig* **7** (3): 273–293.

——— 1908. Anthomyidae. Zoologische und anthropologische Ergebnisse einer Forschungsreise im westlichen und zentralen Südafrika ausgeführt in den Jahren 1903–1905 mit Unterstützung der Klg. Preussischen Akademie der Wissenschaften zu Berlin von Dr. Leonhard Schultze, Professor der Erdkunde an der Universität Jena. Erster Band: Systematik und Tiergeographie. IV. Insecta (Erste Serie). D. Diptera. 4. Anthomyiidae **13** (1): 171–174.

——— 1910*a*. Die von Thomson beschriebenen Anthomyiden der Eugenies Resa. *Wiener Entomologische Zeitung* **29** (2–3): 66–78.

——— 1910*b*. The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr. Stanley Gardiner. Vol. 3. No. IX. –Diptera, Anthomyiidae, mit den Gattungen *Rhinia* und *Idiella*. *Transactions of the Linnean Society of London* (2 Zool.) **14**: 149–163.

——— 1913. Neue afrikanische Anthomyiden. *Annales Historico-Naturales Musei Nationalis Hungarici* **11**: 457–583.

——— 1914. Anthomyidae. *In*: Voyage de Ch. Alluaud et R. Jeannel en Afrique Orientale (1911–1912). Résultat scientifiques. Part 33. Insectes Diptères, IV. Paris: Schulz, pp. 101–143.

——— 1918. Zur weitern Kenntnis außereuropaeischer Anthomyiden. *Annales Historico–Naturales Musei Nationalis Hungarici* **16**: 147–244.

——— 1919. Die Anthomyidengattungen der Welt, analytisch bearbeitet, nebst einem kritisch–systematischen Verzeichnis aller außereuropäischen Arten. *Archiv für Naturgeschichte* (A) **83** (1) (1917): 85–178.

Suwa, M. 1987. The genus *Anthomyia* in Palaearctic Asia (Diptera: Anthomyiidae). *Insecta matsumurana n.s.* **36**: 1–37.

Thomson, C. G. 1869. Diptera. Species novas descripsit C. G. Thomson. *In: Kongliga svenska fregatten Eugenies resa omkring jorden under befäl af C. A. Virgin*, *åren 1851–1853*. 2 (Zoologi), [section] 1 (Insecta). Stockholm (1868), pp. 433–614.

Vockeroth, J. R. 1976. *Craspedochaeta deceptiva* (Malloch), a synonym of *C. punctipennis* (Wiedemann) (Diptera: Anthomyiidae). *Journal of the Australian Entomological Society* **15** (3): 348.

Walker, F. 1858. Characters of undescribed Diptera in the collection of W.W. Saunders, Esq., F.R.S., &c [part]. *Transactions of the Entomological Society of London* (*N.S.*) **4**: 190–235.

Wiedemann, C. R. W. 1818. Neue Insecten vom Vorgebirge der Guten Hoffnung. *Zoologisches Magazin* (*Kiel*) **1** (2): 40–48.

——— 1830. Aussereuropäische zweiflügelige Insekten [concl] **2**, xii + 684 pp. Hamm.

Zimsen, E. 1954. The Insect types of C.R.W. Wiedemann in the Zoological Museum in Copenhagen. *Spolia Zoologica Musei Hauniensis* **14**: 43.

Zumpt, F. & Patterson, P. M. 1952. Flies visiting human faeces and carcasses in Johannesburg, Transvaal. *South African Journal of Clinical Science* **3** (2): 92–106.